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CHICK SEXING INSTRUMENTS AS A MEANS OF SPREAD OF *S. PULLORUM* AND THE EFFICIENCY OF FORMALDEHYDE IN THE STERILISATION OF THE OPTICAL TUBES

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Within the last two years there have been available in this country optical instruments for the sexing of day-old chicks by direct visual examination through the intestinal wall of either the testes or ovary. The reproductive organs are illuminated by a ray of light which passes down a hollow glass tube, approximately 1 inch long by $\frac{1}{8}$ inch external diameter. The whole length of the tube is inserted into the rectum of the chick.

It will be readily appreciated that the use of this instrument is a potential source of spread of infectious agents which may be present in the intestinal tract of the chick. It was therefore considered of interest to investigate whether *S. pullorum* can be transferred from chick to chick by such an instrument and also to test the efficiency of a sterilisation method which is available.

METHODS

A number of the above-described glass tubes were dipped in an undiluted overnight broth culture of *S. pullorum*. These contaminated tubes were inserted into the rectum of day-old chicks. Following this contamination, approximately half the number of tubes were placed in the special steriliser supplied with the instrument, to which had been added one tablet of paraformaldehyde.

THE STERILISATION UNIT

The sterilising unit is an airtight cylindrical metal container of $1\frac{1}{4}$ inches diameter and $2\frac{3}{8}$ inches in length, with screw-on caps at both ends. A 15 grain paraformaldehyde tablet is placed at the bottom of the container below a circular perforated metal disc and six optical tubes are suspended from a similar disc at the other end.

The remaining tubes were left in sterile test tubes at room temperature. Tubes were moved from the steriliser at intervals and cultured in selenite F broth and incubated at 37° C. for 24 hours before plating on to deoxycholate citrate agar with the addition of 1 per cent. sucrose and 1 per cent. salicin. The controls were similarly examined. The day-old chicks used in this work were brooded for a further eight days, when cultures were made from all chicks and from samples of faeces.

RESULTS

A. *Results following the use of* S. pullorum *contaminated instrument on day-old chicks.*—In two experiments a total of 31 day-old chicks were used. Of these, five died within six days. The remaining chicks were killed at various intervals. Bacteriological examination of the intestinal contents and liver of each chick yielded *S. pullorum* from all five chicks which died and from 19 of the remaining 26 chicks which were killed.

Bacteriological examination of 10 bulk samples of faeces taken over a period of six days showed seven samples to yield *S. pullorum*.

B. *Transference of* S. pullorum *from infected to healthy chicks by means of the chick sexing instrument.*—A small number of chicks used in the previous experiment were taken and into the rectum of these was inserted a sterile sexing tube. This tube was then inserted into the rectum of each of a group of four healthy day-old chicks without re-contamination of the tube between chicks. This was repeated, using three separate groups. From the total of 12 healthy chicks used, one died on the third day and the remaining chicks were killed on the eighth day. *S. pullorum* was recovered from the liver and intestines of the chick which died and from two of the remaining 11 chicks which were killed.

C. *Length of survival of* S. pullorum *on contaminated tubes.*—Tubes were contaminated by dipping in a broth culture and then inserting into the rectum of day-old chicks. The tubes were cultured individually, and it was found that *S. pullorum* was recovered from all tubes up to 17 hours. Tubes cultured after this time yielded no *S. pullorum*.

D. *Sterilisation of* S. pullorum *infected tubes.*—The efficiency of the unit supplied for sterilising contaminated tubes was determined by five experiments. Each tube was contaminated by dipping it into an overnight broth culture of *S. pullorum* and then inserting it into the rectum of a day-old chick. The tubes were then placed into the sterilising unit already described.

In the first and second of these experiments the same tablet of paraformaldehyde was used. The top of the sterilising unit was kept closed during the seven-day period which separated these experiments but a detectable amount of formaldehyde still remained in the container. Results obtained from these two tests were identical, showing recovery of *S. pullorum* from those tubes subjected to less than 25 minutes' fumigation. *S. pullorum* was not recovered from those tubes fumigated for longer periods.

The results of the five experiments showed that of seven contaminated tubes subjected to 25 minutes' or less exposure to the fumigation, five remained infected with *S. pullorum*, while the 23 tubes removed from the sterilising unit at varying periods after 30 minutes were negative to the organism.

Discussion

It has for long been realised that the process of chick sexing plays an important part in the dissemination of pullorum disease. In modern hatchery practice chick sexing constitutes a bottle neck through which the majority of chicks must pass and the spread of infection with salmonella organisms from chick to chick by sexers' hands, clothes, etc., has been stressed by numerous workers. Routine precautions which must be observed in sexing rooms and by sexers are outlined in the regulations of the Ministry of Agriculture's Poultry Stock Improvement Plan.

The recent introduction of optical instruments for the sexing of day-old chicks has obviously introduced a further potential danger by the transference of infective material from chick to chick on the surface of the optical tube. The present investigation has demonstrated that optical tubes contaminated with *S. pullorum* remain infective for up to 17 hours. Of 31 day-old chicks infected *per rectum* by contaminated tubes, five died within six days from pullorum disease, while 19 of the remaining 26 chicks killed on the eighth day yielded *S. pullorum* from their livers and intestinal contents. Chicks so infected are capable of spreading further infection in that of 10 bulk samples of faeces taken over the period of six days, seven yielded *S. pullorum*.

On the other hand, optical sexing machines have the definite advantage that whereas the disinfection of sexers' hands contaminated with faeces during manual sexing of chicks presents nearly insurmountable difficulties, the optical tubes can be conveniently and efficiently sterilised by formaldehyde. Complete sterilisation was obtained after 30 minutes' exposure to formaldehyde in the sterilisation unit described. Any of the six tubes in the sterilisation unit can be taken out and changed round in less than 30 seconds and it is thus practicable to change tubes between each batch or breed of chicks and used tubes can be further sterilised overnight.

Summary

1. It has been demonstrated that the glass tube of a chick sexing instrument is capable of transferring *S. pullorum* from diseased to healthy chicks.

2. The method of sterilisation of the tubes by means of an airtight steriliser containing a paraformaldehyde tablet was satisfactory. *S. pullorum* was killed on contaminated tubes after 30 minutes' exposure.

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THE RESPECTIVE VALUES OF INJECTIONS OF SYNTHETIC l-ADRENALINE AND l-NOR-ADRENALINE FOR SOME CIRCULATORY CONDITIONS IN VETERINARY PRACTICE

BY

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Adrenaline (suprarenin) or dihydroxyphenyl - methyl - amino-ethanol differs from nor-adrenaline in possessing a methyl group (Holtz, 1951). Both substances are secreted by the adrenal glands of the cat and dog (Bülbring, 1949 ; Burn & Hutcheon, 1949), and have also been isolated from the adrenal glands of most domestic animals (Holtz & Schümann, 1948). For the purpose of these investigations the pure synthetic levorotatory form of adrenaline and of nor-adrenaline was used.

Historical

The concept that other substances than adrenaline were liberated from the sympathetic nerve endings was first offered by Barger & Dale in 1910. In their paper on the chemical structure and sympathomimetic action of amines, they based their hypothesis on the ground that some of the effects seen in the body on sympathetic stimulation were not accurately reproduced by the injection of adrenaline. The motor effects of the sympathetic nervous system, such as the contraction of the trigone of the bladder, could be reproduced by the injection of adrenaline only with difficulty, while some of the inhibitor effects, such as the inhibition of the fundus of the cat's bladder, were more easily produced by the injection of adrenaline than through the agency of sympathetic nerve stimulation.

Nor-adrenaline has already been synthesised in 1904 by Stolz, and in 1934 Bacq suggested that the excitatory effects which could be obtained when the sympathetic nerves were stimulated were in a measure due to a substance which behaved like nor-adrenaline. Similar suggestions were made, on the basis of experimental evidence, by Gaddum & Goodwin (1947) and by Goodall (1950). Von Euler (1948, 1949) isolated nor-adrenaline from various nerves, and suggested that this substance was the principal chemical transmitter of adrenergic nerve impulses. Von Euler confirmed this in later work published in 1950. Holtz & Schümann (1950) found that the hormone which was released from the adrenal glands as a result of occlusion of the carotid sinus was not comparable in effect with adrenaline injection and that its pressor action was similar to that of the nor-adrenaline hormone.

Holtz and associates (1947) showed that nor-adrenaline was not a breakdown product of adrenaline as first suggested, but rather the last stage of the hormonal synthesis of the latter hormone. The findings of Holtz and others (1938) that dopacarboxylase was the most important ferment in the biological synthesis of adrenaline lent support to this hypothesis. This dopacarboxylase, which was found to be especially abundant in the liver and kidneys, transforms the pharmacologically inactive amino acid l-dioxyphenylalanine (DOPA) into oxytyramine, which, although a pressor substance, is 30 to 40 times less active in its pressor action than nor-adrenaline (Holtz & Schümann, 1950). Holtz & Kronberg (1948) and Holtz (1949) showed that this oxytyramine could be converted into the more active pressor substances by the action of the isolated adrenal gland. The second part of this reaction, *i.e.*, the conversion of nor-adrenaline to adrenaline, could also be observed on perfusion of the gland with heparised

blood and nor-adrenaline, as well as on allowing nor-adrenaline to remain in contact with minced adrenal tissue (Bülbring, 1949; Burn & Hutcheon, 1949).

Experimental work has lately been published by Pickford & Watt (1951) on the action of nor-adrenaline in respect of its action on diuresis, and on the blood flow through various organs by Burn & Hutcheon (1949). Clinically, in the human subject nor-adrenaline has been used for various conditions, and reports have been published on its effect on the blood pressure, by Goldenberg and others (1949), Swann (1949, 1952), by Bromage in 1952, as well as by Inglis in the same year. Its effect on the renal circulation has been described by Churchill-Davidson and others and as a vaso-constrictor agent by Ghose in 1952, who also reported that he used it after operations on extremely ill patients.

Introduction

Although the actions of pure adrenaline (*i.e.*, without admixture of nor-adrenaline, as in the natural product) and nor-adrenaline overlap in some of their effects, there are certain advantages in discriminating therapeutically between the two and in using each for its specific indications.

The general effect of adrenaline is to cause an increased blood flow in the muscle tissues, associated with a transient peripheral vasodilatation (Allen *et al.*, 1946). If the dose is large enough, this is followed by a constriction of the muscle vessels, followed later by a lowered vasoconstrictor tone (Swann, 1951).

Adrenaline also causes a specific stimulating effect on the heart, so that the output may be raised by as much as 100 per cent. (Goldenberg, 1951). Nor-adrenaline causes no direct increase in the cardiac output and its administration may even be associated with a small decrease (Starr, 1937).

Clinically, it is often desirable to raise the blood pressure and to oppose a peripheral loss of tone in the patient, without increasing the burden on the heart through inducing an unnecessary increased heart rate and output, such as would undoubtedly be the case if adrenaline was used to try to obtain the required blood-pressure rise. In some instances, moreover, the injection of adrenaline may be contraindicated. Under certain forms of anaesthesia, such as chloroform, chloral hydrate (Völker & Krause, 1952) and cyclopropane (Soehring, 1951), stimulation of the heart with adrenaline will often lead to fatalities due to the induction of fibrillation of the heart.

Not only therapeutically, such as in anaesthetic collapse, but also prophylactically, as in high epidural anaesthesia in the dog,* it may be necessary to inject a peripheral vaso-motor stimulant. In the case of older animals, or animals that have been subjected to strain, stimulation of the heart may well be undesirable. In the latter case it should be remembered that stimulation of the heart with adrenaline greatly increases the oxygen consumption. This, at a time when the venous return may be impaired, may be conducive to acute cardiac damage. According to von Euler (1950) nor-adrenaline is also less toxic than adrenaline when both are given in large amounts.

On the other hand, in acute cases of cardiac arrest, the specific stimulating effect of adrenaline on the heart is directly indicated. The effect of synthetic l-adrenaline on the heart is many times as great as caffeine (Merz, 1953). The specific stimulating effect of adrenaline on the heart is thought to be due to a direct action on the pacemaker (Barcroft & Konzett, 1949).

Much of the pressor effects of commercial preparations of natural adrenaline *are due to their nor-adrenaline content* which, according to West (1952), may be as high as 20 per cent. (activity). The injection of adrenaline (*sic*) usually results in a blood-pressure rise, although under certain conditions it may have little effect, or actually result in a fall of the blood pressure, such as occurs when small quantities are injected. When a rise of the blood pressure is obtained following an injection of adrenaline this may be due less to peripheral vasoconstriction than to the stimulation of the cardiac output ; and the blood-pressure rise is followed by a depression. Goodman & Gilman (1941) have suggested that this may be explained on the basis that adrenaline tends to constrict the arterioles while at the same time it dilates the capillaries, the latter being of longer duration than the former. On the other hand, as has already been mentioned, the administration of adrenaline is thought to be followed by a loss of vasoconstrictor tone. In cases, therefore, where the fall of the blood pressure is associated with peripheral vaso-motor collapse the logical indication is for a drug that is able to compensate for the loss of vaso-motor power and to give tone to the blood vessels of the periphery.

Another advantage, under these conditions, in the therapeutic use of a drug such as nor-adrenaline, that acts directly on the peripheral blood vessels rather than on the heart as in the case of adrenaline, or centrally as in the case of cardiazol (Valdecasas, 1949) is that the first will still be effective when the central nervous system has been largely depressed by narcotics, or when the heart has difficulty in compensating. In respect of a lack of effective power of the central pressor action, it has been found that nor-adrenaline will still be effective in raising the blood pressure when the central nervous system is so depressed by substances such as morphine or by blood loss that the carotid-sinus occlusion would elicit no blood-pressure response. This latter effect has been repeatedly demonstrated on cats and dogs where the carotid-sinus reflex has been rendered ineffective through deep anaesthesia, or where the post-operative animal, due to heavy blood loss or impending surgical shock, no longer evinces any result from central stimulation of the blood-pressure regulation mechanism (*vide infra*).

The principal use of adrenaline in veterinary practice is restricted to the therapy of acute cardiac arrest, or impending heart failure, such as those which are sometimes experienced on the induction of anaesthesia. In those cases it is essential to stimulate the heart to a rapid return of activity while at the same time the task of that organ should not be increased. In this connection it is important to realise that the injection of nor-adrenaline causes a considerable increase in the peripheral resistance. The rise in the peripheral resistance causes the heart to work in the face of a considerably augmented pressure and, what is probably of greater moment, in the face of an enhanced venous return.

The Effects of the Administration of Pure Synthetic l-adrenaline and l-nor-adrenaline

The effect of injections of adrenaline and nor-adrenaline was tested on 10 cats and on five dogs. In each the effect of some 10 to 15 injections was noted. The animals were under barbiturate and, in a few cases, chloralose anaesthesia. The blood-pressure was recorded in all cases.

(*a*) *The Effect of the Injection of l-adrenaline.* — The principal effect that was noted following the injection of l-adrenaline was an immediate increase in the heart rate and in the volume of the pulse. In most cases this was associated with a rise in the blood pressure although to a lesser extent than following the injection of similar amounts of nor-adrenaline. In all cases the blood pressure fell again rapidly, and usually to a level below that obtaining at the time of the injection. This diphasic response of the blood pressure was

* To be published.

typical, and the fall in the blood pressure seemed to take effect when the stimulus to the heart had passed, showing that in all probability it was associated with a loss of tone of the blood vessels primarily masked by the cardiac output. Subsequent injections appeared to have progressively less effect.

The amount of adrenaline that was injected (intravenously) was approximately 5γ per kg. bodyweight, although sometimes larger doses were given—up to 20γ per kg. These large doses appeared to have a deleterious effect on the organism, revealing itself in a lowered reactivity of the blood vessels and a subsequent lowered blood pressure. In one case death, due to fibrillation of the heart, supervened. In all cases the increase in the heart rate appeared to be associated with cardiac arrythmia.

The deleterious effect that was observed as a result of repeated injections of adrenaline would indicate that a continuous effect such as would be achieved by the intramuscular administration of adrenaline—as might be given in cases of impending collapse or in the form of a continuous infusion during operation—would not be attended with favourable results.

(*b*) *The Effect of the Injection of l-nor-adrenaline.* — The intravenous injection of l-nor-adrenaline into the normal anaesthetised animal was followed by a considerable rise in the blood pressure. After the blood pressure had reached a peak, it would fall again rapidly, but in most cases the general level would remain considerably higher than before the injection. The amount that was administered was usually about 1 to 2γ per kg. b.w., and repeated injection tended to elicit the same response unless large amounts were injected at short intervals when a tachyphylactic effect would become evident. The heart rate of the recipient would remain the same or tend towards a bradycardia. Often there was an initial slight increase, which may have been associated with the increased venous return, before the slowing became evident. This depression of the heart rate could be abolished with atropine.

On intramuscular injection the rise in the blood pressure would be maintained. This was more noticeable in those cases where the blood pressure has been lowered previously. The injection via the intramuscular route is not so effective as the continual administration by vein. On the other hand, the latter, in the form of a continuous drip, has little practical value in veterinary work as a controlling check on the blood pressure cannot be effected. As an intramuscular injection, in cases where it is desired to raise the blood pressure, or to prevent its fall as in high epidural anaesthesia, about 500γ may be injected for every 10 kg. b.w. (*i.e.*, $\frac{1}{2}$ c.cm. of the 1/1,000 solution).

After the injection of sympatholytica, such as yohimbine or ergot fractions, the blood pressure would continue to rise to nor-adrenaline injections, although the result of an injection of adrenaline would be a depression of the blood pressure. The inhibiting effect of adrenaline on organs such as the uterus (isolated) was found to be on an average 20 times as great as that of nor-adrenaline. In contrast to adrenaline even the smallest doses of nor-adrenaline were always pressor in action.

Clinical Application

The effects on the heart and the circulation that may be elicited by the injection of the pure l-adrenaline and l-nor-adrenaline, lead to a number of applications in general practice. Of these, the most important are those associated with the treatment and prevention of acute circulatory collapse due to accident, surgical interference, and anaesthesia. The procedure under the conditions of veterinary practice entails some difficulties associated with the lack of facilities for making an accurate estimation of the patients blood pressure. This precludes the use of continuous drip infusions during anaesthesia, while, at the same time, the indications for treatment with these substances become more vague. In many cases the first symptoms which indicate the necessity for the institution of therapy cannot be detected, so that the condition that is to be treated cannot be checked in its primary stages.

The results of the trials with injections of l-adrenaline and l-nor-adrenaline iterated above, indicate its practical use in the following conditions :—

(*a*) *Anaesthetic Collapse.*—A certain proportion of cases that are subjected to anaesthesia manifest collapse in the *early stages of induction.* This condition, however, must be carefully differentiated from (1) collapse due to simple overdosage ; (2) cases associated with primary heart failure. In a few cases where the blood pressure was recorded at the time of the induction of anaesthesia, it was found that after only a fraction of the normal anaesthetic dose had been administered (in these cases barbiturate) the animal showed a sudden and profound fall in the blood pressure which appeared to be due to peripheral circulatory failure. These cases may also be differentiated from those in which the condition is due to excessive stimulation of the vagal centres by the fact that the pulse rate in the former is increased, or remains the same. In the latter condition the pulse rate is slowed. The raised pulse rate may be ascribed to the sudden lowering of the venous return due to the fall in peripheral vascular tone.

When these cases are left untreated, the vascular hypotension tends to remain for a long time, as the animal finds great difficulty in detoxicating the anaesthetic agent, while the blood flow through the parenchymatous organs, especially through the liver, is curtailed as a result of the hypotension. The state of anaesthesia, as well as the hypotension, may last for an abnormally long time in spite of the fact that only a small dose of the anaesthetic has been administered. During this time, irreversible changes may take place in organs such as the liver, or damage be done to the heart or the central nervous system. In some cases the condition may revert to one of actual surgical shock from which the animal will fail to recover if left untreated.

The mode of treatment in these cases is to administer small doses of nor-adrenaline intravenously, preferably in a diluted form, and in quantities of 1 to 2γ per kg. b.w., until a response becomes evident. An intramuscular injection of the same substance may then be made.

(*b*) *Acute Nerve Shock.*—This condition is met with in animals that have suffered from some overwhelming stimulus in the form of pain, fear, or trauma. It is characterised by a somewhat raised pulse rate which often is barely perceptible. Characteristic of the condition is the depression of the central nervous system which appears to border on the unconscious. Consciousness, which under these conditions would be lost in the human subject, is retained in the animal. On the other hand, perception capacity is largely lost. Unreasonable fear is shown, and failure to recognise familiar people. The animal often demonstrates unreasoning attempts to bite or scratch, or to take flight if approached.

Physiologically, this condition manifests itself in a localisation of the blood in various localities in the body with consequent " starvation " of the higher centres and a lowered venous return to the heart.

In the therapy of this condition, besides the usual treatment entailing warmth and sedatives, the blood flow to the higher centres may be assisted by the administration of small doses of a vascular stimulant : this in spite of the fact that the blood vessels of the skin apparently are already constricted. As long as an adequate flow of blood to the higher

centres and to the heart is assured, the animal will regain control of its nervous functions and restore the correct distribution of blood in the body. For general purposes, caffeine is probably the drug of choice as an initial therapeutic agent, especially having regard to its dilatatory action on the coronary vessels, and its centrally imposed effect on the blood vessels which results in a small rise in the blood pressure (Hahn *et al.*, 1950). If, however, this proves to be insufficient to ensure the proper redistribution of the blood flow, it may be assisted by *small doses* of nor-adrenaline which tends to have a more certain effect as it acts on the blood vessels directly. In this condition, doses of about 10γ per kg. b.w. may be given, administered intramuscularly.

In the treatment of this condition care must be taken to differentiate it from acute internal haemorrhage, which manifests rather similar symptoms. The treatment of the latter condition will, of course, entail haemostasis and possibly replacement therapy.

For the purpose of effective redistribution of the blood, extract of the posterior lobe of the pituitary *cannot be considered owing to its constricting effect on the coronary vessels* (Melville, 1933 ; Sollmann, 1937 ; Gaddum & Goodwin, 1947 ; Barcroft, Churchill-Davidson & Swann, 1951 ; Völker & Krause, 1952). The constriction of the coronary vessels in a heart that is subjected to excessive strain is extremely liable to lead to reduced function and heart damage. Nor-adrenaline effects an increase in the coronary flow, according to Marsh, Pelletier & Ross (1948) and Burn & Hutcheon (1949).

(*c*) *Surgical Shock.*—Investigations on animals in a state of surgical shock have indicated that when the shock has become sufficiently deep for the subject to fail to react to central nervous stimulation, it will still show reaction to the intravenous administration of nor-adrenaline ; in fact, the latter reaction tends to persist until the animal appears to become unreactive to all stimulation, *i.e.*, until it enters upon a state of irreversible shock.

Although it has as yet not been possible to demonstrate this experimentally beyond doubt, there are indications such as those mentioned above to show that in between the responsive state of shock—*i.e.*, the state when the animal will readily respond by a rise in the blood pressure and an amelioration of the condition to correct infusion therapy (Harthoorn, 1953) and the irreversible state, when infusion therapy is no longer of avail—there is a stage when resuscitation may be effected by the administration of plasma or a colloidal substitute together with a substance that will help to restore the tone of the blood vessels. These indications are sufficient to warrant, in cases where the patient shows signs of failing to respond to normal infusion therapy, the inclusion in the infusion fluid of a quantity of nor-adrenaline which normally caused a physiological rise in the blood-pressure level. In a drip infusion, this would be about 50γ per kg. b.w.

(*d*) *Acute Cardiac Arrest.*—Although this condition may be considered here, it is of relatively little importance as it is seldom that its treatment is called for in veterinary practice. The preponderance of cases of apparent cardiac arrest appear to occur under the influence of general anaesthesia, especially during induction. Cases may be recalled of sudden death, apparently due to heart failure during the induction of chloroform anaesthesia in the cat, or during the initial stages of chloral hydrate anaesthesia in the horse. The predisposition of the heart to go into a state of fibrillation under the influence of these anaesthetics, however, would suggest that a proportion of these cases was due rather to that condition than to actual failure of the heart, especially as so often they occur during the induction phase of the anaesthesia, accompanying and during excitement. Actual heart failure more often is associated with too large a dose of the anaesthetic used, or central anoxia, although collapse of cardiac origin can be associated with excessive vagal stimulation. Heart failure which occurs outside the clinic, such as that due to electric shock, need hardly be considered in the light of practical therapy.

In acute cases of cardiac arrest, the injection of adrenaline into the heart, diluted with Ringer solution or with blood, is often effective in restoring the heart pump. In these cases the potential danger of inducing cardiac fibrillation, although great, is justified in the face of the imminent demise of the patient. The resuscitation of the flagging heart, as determined here under experimental general anaesthesia, has little counterpart in general practice, however, as the animals on which those particular observations were made were, in the majority of cases, under the influence of mechanical artificial respiration. In practice, therefore, the respiratory arrest would have given grave concern long before the more serious state of cardiac failure arose, with consequent discontinuance of the administration of anaesthesia and analeptic therapy.

Discussion

As a result of the experimental injection of quantities of l-adrenaline and l-nor-adrenaline into cats and dogs, and the recording of the effects produced, certain suggestions have been made as to the employment of these drugs in general practice. It has been established that these two substances affect the intact anaesthetised animal in ways that differ widely in their action and their ultimate effect, and that optimum results will not be obtained by using a mixture of the two substances for one set of indications.

The knowledge that nor-adrenaline has only a slight direct effect on the heart, and that the ultimate effect is mainly connected with the enhanced venous return and blood pressure, enables it to be used in a number of conditions where the stimulation of the heart is not the primary object, or is contraindicated. The effects on animals other than the cat and dog have not been essayed and are not necessarily identical. The injection of nor-adrenaline in the intact dog, for instance, always gives rise to a reflex bradycardia. In the cat, where the vagal tone is not so great, the effect varies and a depression of the heart rate is not always produced. In the rabbit, on the other hand, the injection of nor-adrenaline invariably produces a tachycardia.

Although the effect of the injection of nor-adrenaline varies in the different species, the injection into one type of animal of different amounts in relation to the bodyweight makes little or no difference in the mode of action. Even the smallest doses, for instance, were found to be pressor in action. The action of adrenaline, on the other hand, tends to be modified in relation to the dose employed. If adrenaline is injected in small doses, the accelerating effect on the heart will be stronger than the reflex depression. In larger doses the reflex slowing of the heart may be strong enough to result in an actual bradycardia. In very small doses, the peripheral dilatatory effect may not be entirely compensated by the effect on the heart, and in that case a depression of the blood pressure will ensue.

The respective actions of l-adrenaline and l-nor-adrenaline may be summarised in the following general actions : (1) l-adrenaline causes a decrease in the peripheral resistance and has a direct stimulating effect on the heart. In small quantities it may depress the blood pressure. When injected in larger quantities the blood pressure reacts according to the state of the blood vessels and an increased heart output is obtained. (2) l-nor-adrenaline causes an increase in the general peripheral resistance through the agency of mainly peripheral vasoconstriction, accompanied by a rise in the

blood pressure. The direct action on the heart is slight, although it tends to cause an increased minute volume through mediation of the increased venous return, while at the same time there will tend to be a reflex depression of the heart rate due to the enhanced blood pressure. Unlike l-adrenaline, l-nor-adrenaline does not give rise to a reflex depression of the blood pressure at the termination of its activity.

Summary

The effect of the injection of l-adrenaline and l-nor-adrenaline on the heart and circulation of the normal anaesthetised cat and dog has been described.

The use of these substances in various conditions in general veterinary practice has been suggested.

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THE VETERINARY SERVICE IN NORTHERN IRELAND

(Contributed)

It is hoped that the appointment of Mr. J. I. Magowan, M.R.C.V.S., D.V.S.M., to the position of Permanent Secretary to the Ministry of Agriculture, Northern Ireland, announced in your issue of June 20th, may be held to justify this brief review of the development of the Veterinary Service in Ulster.

Prior to 1929 the staff in the employment of the Ministry of Agriculture—10 in all—was just sufficient to carry out duties under the Diseases of Animals Acts, now there is a staff of over 100.

The first expansion occurred on the introduction of the Agricultural Produce (Meat Regulations) Act (Northern Ireland), 1930, while the late Mr. F. Emery, F.R.C.V.S., was Chief Veterinary Officer, and was mainly due to his efforts. This involved the inspection of all meat and bacon carcases for export which, when bacon carcase grading was introduced, led to the control of that procedure by the Veterinary Division.

Mr. James McAllan, M.A., B.Sc., M.R.C.V.S., succeeded Mr. Emery as Chief Veterinary Officer. He brought to Northern Ireland his wide experience in meat and milk control and when the Milk and Milk Products Act was introduced in 1935 he undertook to implement that scheme. This provided that all producers should be licensed and that control necessitated that methods and premises had to be of a certain standard and the health of milk stock had to be ensured. At a later stage in Mr. McAllan's term of office the Fat Cattle Subsidy Scheme was introduced in Great Britain and Northern Ireland under the Livestock Commission. Northern Ireland had no system of Auction Marts and responsible officers with livestock knowledge had to be found to implement the scheme. Mr. McAllan appreciated that he had on his staff a sufficient cadre of men who, on account of their background and training, were capable of the grading of fatstock and so undertook this work which further expanded the use of the Veterinary Service.

While there could be some difference of opinion as to whether the veterinary profession should have accepted such work, it has resulted in nothing but good for the profession in Northern Ireland. This certifying of fat cattle for subsidy led to the Veterinary Service being asked to undertake the purchase of all cattle and sheep when the Meat and Livestock Control Scheme was introduced in January, 1940. A concentration of slaughterhouses took place and each was controlled by a veterinary officer ; a staff of about 30 is still engaged in this duty. The extent of this work may be illustrated by the numbers and value of fatstock purchased in 1952—fat cattle, 308,035 ; sheep, 503,294 ; total value, £19,786,712.

Later extensions of the Veterinary Service were introduced during the term of office as Chief Veterinary Officer of Mr. A. Monro, F.R.C.V.S., and have continued on his retirement under the supervision of Mr. H. L. McConnell, M.R.C.V.S., the present Chief Veterinary Officer. These extensions are the Attested Herds Scheme and the Artificial Insemination Service, the technical side of which is completely controlled by the veterinary staff. Each sub and main centre is in the charge of a veterinary officer.

The Animals Diseases Research Division under Professor Lamont has earned international recognition by its achievements. Apart from original research work the Stormont Laboratory has two other functions : advisory to the veter-

inary profession and agriculture ; and secondly, as lecturers in Veterinary Science in Queen's University, Belfast, where Professor Lamont holds the Chair. The adequate service provided and its accessibility is fully appreciated by the agricultural community. Nowhere in the British Isles is there a closer link between research and the field.

The success of the various schemes undertaken by the profession culminated in the appointment of Mr. McAllan as Assistant Secretary. He is in charge of the Meat and Livestock Control Scheme, bacon and ham control and that of milk and eggs. This appointment was followed later by that of Mr. Magowan to a similar position in charge of crop production, livestock improvement schemes, research, agricultural education, statistics and economics. Mr. Magowan has now been appointed as Permanent Secretary to the Ministry—an event unique in the history of the veterinary profession.

It would be hard to find a similar area where there is greater utilisation of the profession than in Northern Ireland, or one in which there is such close liaison between the various branches of the profession. The administration and implementation of the various schemes mentioned demonstrated to the Ministry in Northern Ireland the versatility and potentiality of the Veterinary Service. The training of the present-day veterinary surgeon has ensured their success, demonstrating the true rôle by which veterinary science may be fully integrated with agriculture as a whole. In fact, the present intensive production of bacon, milk, eggs, mutton and beef could take place only in conjunction with the great contribution veterinary science has made in disease control and the solution of management problems.

The members of the Northern Ireland Division are to be congratulated on their achievements. Both Mr. Magowan and Mr. McAllan, we feel sure, would endorse the sentiment that without the help of their entire staff the present happy state of affairs for the profession in Ulster would not exist.

ABSTRACT

Benzene Hexachloride Poisoning of Emaciated Sheep*

A toxicological investigation was made into the dipping of emaciated sheep in suspensions of BHC. This work was initiated by a sheep dipping accident in which a 10 per cent. mortality followed immersion in a BHC suspension at a concentration of 0·06 per cent. gamma isomer (0·48 per cent. BHC technical).

Groups of emaciated sheep of all types, and sheep in good condition, were dipped in suspensions of BHC or the gamma isomer, and the effect compared on the two classes of sheep.

The results indicated that lactating, emaciated ewes were approximately eight times as susceptible to BHC poisoning as lactating ewes in good condition. Emaciated lactating ewes were also more susceptible to intoxication by BHC, than their lambs, wethers, or non-lactating ewes.

This increased susceptibility of emaciated lactating ewes was also observed, to a lesser extent, with dips containing Toxaphene (chlorinated camphene), and chlordane.

D. W. J.

*Benzene Hexachloride Poisoning of Emaciated Sheep. Radeleff and Bushland. (1953). *Vet. Med.* **48**. 53-58.

REVIEW

[Proceedings of the Society for the Study of Fertility (No. IV). (1952). Published for the Society by W. Heffer and Sons, Cambridge, price 10s.]

The Society co-ordinates the activities of investigators whose work has some bearing on the problem of fertility in man and animals. This issue of its proceedings illustrates the diversity of this problem and the extent of the Society's success in bringing together workers from different fields. Some of the papers are clearly relevant to the problems met in veterinary practice and all will be of interest to veterinarians who are specially concerned with the problem of fertility.

The significance of early embryonic death in relation to fertility is effectively illustrated by C. G. Hartman with the results of a study in the opossum.

S. Zuckerman co-ordinates some of the information which exists about the origins and functions of the different types of cell in the ovary and shows that the different ovarian components have a considerable degree of functional interdependence. All who are interested in reproductive phenomena should read this stimulating paper.

S. A. Asdell reviews some investigations of the relationship between intelligence and fertility in man.

The description of mammalian spermatogenesis by L. A. Harvey is incomplete because it contains no reference to the important results of recent histochemical studies of spermatogenesis but it forms a valuable introduction to four papers which deal with the development and morphology of spermatozoa.

The structure of fowl spermatozoa is described by G. W. Grigg. The description is based largely on observations made by the author with the electron microscope. The acrosome of the fowl spermatozoon has two separate components; it is said to be histochemically different from the acrosome of the mammalian spermatozoa which have been investigated.

A brief account of the results of a study of spermatogenesis in the fowl, made with the phase-contrast microscope, is given by P. E. Lake and J. Smiles. They claim that the manchette is formed by a longitudinal shrinkage of the nucleus and intussusception of the nuclear membrane. The mitochondrial sheath is said to form outside the remains of the manchette. Previous accounts have indicated that the mitochondria are assembled within the manchette.

A study of the tail structure of mammalian spermatozoa is reported by C. E. Challice. The illustrations include some remarkable electron micrographs of sectioned spermatozoa.

The results of a morphological study of human spermatozoa are reported by H. Bayle. The structure of the human spermatozoon appears to be basically the same as that of other mammalian spermatozoa. Two cap-like structures are described which are said to be the acrosome and *galea capitis*. These structures are said to be visible with the light microscope also. It has recently been pointed out that the evidence of the existence of these two structures in the spermatozoa of the ram and bull is open to criticism; the same criticisms may be applicable here.

Azoospermia of excretory origin, its pathology and its treatment in man are discussed in a second paper by H. Bayle. The condition may be due to obliteration of the lumina of the epididymis and vas deferens by infective processes, dystrophic changes, trauma or congenital malformation. An analysis of a series of cases and of the results of surgical treatment (vaso-epididymostomy) is given. It is concluded that surgery is justified in all cases

of excretory azoospermia except those due to tuberculosis. An intriguing point made in favour of the operation is that the scars become hidden by the pubic hair.

The absence of precise criteria of fertility is a great obstacle to investigations of this problem in man. A. F. McLeod has attempted to overcome this difficulty by comparing the semen characteristics of the male partners of fertile couples with those of the male partners of infertile couples. The tendency for incidence of abnormal spermatozoa to increase with decreasing sperm density was more marked in the infertile group but there was no clear relationship between morphological characteristics of spermatozoa and fertility. There was a correlation between the motility of spermatozoa and fertility.

The vascular supply to the testis and epididymis in the rat and man is described by E. W. Macmillan. Ligation of the superior trunk of the epididymal artery in the rat is followed by fragmentation of the lining epithelium of the epididymis. There is subsequent intratesticular tension following blockage of the efferent tubules. The author says that for anatomical reasons the human testicle may be less vulnerable to injury of this kind but concludes that there is a good reason to conserve the epididymal blood supply in operations of the inguinal region.

The surgical construction of an artificial spermatocele in man is described by D. Young. The operation is intended to provide a means for the collection of semen in men who show congenital absence of the vas deferens. The case described was surgically successful but two attempts to demonstrate spermatozoa in fluid aspirated from the spermatocele were unsuccessful. The references to similar operations in dogs by Lespinasse may be of interest to veterinary surgeons.

The paper by J. Wilkinson is an interesting illustration of the effect of virus infection on cell division in plants. In plants affected with "aspermy" disease growth is stunted and the fruits are usually devoid of seed. Cytological abnormalities have been demonstrated during the meiosis of diseased pollen-mother cells and it is probable that the impaired fertility of affected plants is connected with these changes.

M. Barton evaluates treatment of sterility in women with antibiotics. Some results of treatment of cervical infection are presented as evidence that infective conditions may affect ovarian secretion. This conclusion, which is based on the observation that fluctuations in the temperature during the luteal phase are controlled by antibiotic treatment, does not seem wholly justified.

B. Solomons discusses the indications for surgical treatment of cervical abnormalities in women and gives details of his modification of standard operative procedures. Nylon is specified for sutures. Data are presented to show that surgery of the cervix need not prevent future pregnancy with normal labour.

The establishment of further international standards is announced in the 6th Report of the Expert Committee on Biological Standardisation (*WHO Tech. Rep. Ser.*, No. 68, Stationery Office, 1s. 6d.). They include standards for anti-*Brucella abortus* serum, scarlet fever streptococcus antitoxin, staphylococcus β antitoxin and dimercaprol. Work has been proceeding on an opacity standard for bacterial suspensions and an international reference preparation with an opacity of 10 I.U. per ml is to be established.

REPORT

[New Zealand Department of Agriculture: Annual Report of the Veterinary Research Division, 1951-52.]

This report gives a great deal of useful information, not so much perhaps in the realm of disease research and control—New Zealand is blessedly free from major epizootics—as in the realm of breeding and nutritional problems. Mr. Filmer, the Director, and his staff of scientific workers are to be complimented on the amount of research accomplished during the year and the results obtained of sound practical value to the development and productivity of the livestock industry.

Sheep Breeding Projects.—Further work on the practice of flushing ewes before tupping has confirmed that a flushing period of two weeks is sufficient for optimum results.

The outcome of an experiment carried on for four years gives reasonable promise that increased fertility in flocks can be obtained through selective breeding.

Nutrition Experiments.—A method for the quantitative estimation of the rachitogenic factor in green foods has been worked out and by it the amount in green leaves of oats and perennial rye grass has been determined as from 80 to 320 units per g. dry matter.

Sheep Disease Control Projects

Facial Eczema and other Photosensitivity Conditions.—Very few outbreaks of facial eczema have been reported this year, probably owing to the good summer rains which were experienced. Guinea-pigs fed on dried short-rotation rye grass which had produced facial eczema in lambs developed liver lesions broadly similar to those seen in lambs affected with facial eczema, and these laboratory animals will now be used to test extracts made from facial eczema pasture and other plants.

Work on the pigments in dried panicum which produce photosensitivity in rats has been concluded. The two pigments mainly responsible have been identified as pyrrophaeophorbide a and phaeophorbide a. Two further pigments have also been identified and isolated in small amounts. All these pigments are degradation products of chlorophyll, and since they do not occur in green millet they appear to be formed in this plant during the process of drying. Two other panicum species which occur as weeds in New Zealand have also been proved to be toxic.

Blackleg.—In the control of this disease the use of an improved type of vaccine has continued to give most satisfactory results. A cure has been effected also when penicillin cerate has been given in adequate dosage in the early stages of infection.

Foot Abscess in Sheep.—A high incidence of this disorder has been recorded from some districts. It has been successfully treated with sulphanilamide by mouth and sulphapyridine or sulphamethazine by mouth or injection when the abscess had not burst. When it had, cotton wool pads soaked in cod-liver oil and bandaged to the part gave good results.

Abortion in Ewes.—The cause of one form of abortion called, for want of a more exact name, ovine abortion I, has now been identified as a slightly pleomorphic, small acid-fast rod morphologically similar to the organism seen in some field cases of epididymitis in rams and isolated from the foetal membranes of ewes experimentally inoculated with infected ram material. There is another type of abortion—ovine abortion II—which is due to an organism probably of fungal or protozoan character. Ram infertility caused by epididy-

mitis has been found to be widespread in some areas of New Zealand.

Red Water in Calves.—This disease, following *Leptospira pomona* infection, has been shown to yield to the early use of antibiotics. The general incidence, as shown by the use of the micro-agglutination test on dairy cows, is in the region of 25 per cent.

Lactation Tetany in Dairy Cows.—This has been shown to be caused by a number of factors connected with feeding and management such as : underfeeding, feeding a ration mainly or wholly of fresh pasture, sudden changes in quality and quantity of pasture, sudden stoppage of hay or silage, periods of bad weather, prolonged oestrus excitement, and infections of various kinds. In laboratory trials the underfeeding of cows accompanied by a change from a diet of adequate hay, kale and spring pasture to one of inadequate spring pasture alone was followed by lowered blood calcium and magnesium and symptoms of tetany.

Trace Elements

Cobalt.—There is a marked seasonal variation in the cobalt content of grass. The lowest values occur during midsummer, the critical period of lamb unthriftiness. The higher cobalt content of pasture, which occurs during autumn and winter, could account for the tendency of sick lambs to recover during this period of the year. Top dressing with 5 oz. of cobalt sulphate per acre if applied in the spring generally suffices to carry lambs over the summer, but even 10 oz. per acre if applied during the autumn is of doubtful value. There is no evidence that heavy liming affects the cobalt status of pasture.

Copper.—It has been found that top dressing with 5 lb. bluestone per acre in the spring is effective in improving the copper content of deficient sandy soils, but this improvement is of short duration.

New Diseases.—Two diseases have been encountered in New Zealand for the first time : foal septicaemia, caused by *B. viscosum equi*, and a fatal disease of chicks. The disease in chicks is characterised by oedema of subcutaneous tissue, muscles and some internal organs ; haemorrhages into muscles and fat ; fat necrosis, degeneration of skeletal and gizzard muscles and ulceration of the lining of the gizzard.

This extract of a departmental report will prove worth while if it serves to bring fresh light to bear on some problems of animal disease and malnutrition which exist in other countries besides New Zealand.

W. W. H.

"THE GRASSLAND AGE"

At a luncheon held on Wednesday of last week to mark 25 years' work at the Jealott's Hill Agricultural Research Station in Berkshire of Imperial Chemical Industries, Limited, Mr. S. W. Cheveley, Chairman of the Central Agricultural Control of I.C.I., said he believed that this century would be written into agricultural history as the grassland age. For our meat supply there was no reason why we should depend on "frozen favours from foreigners."

Sir Thomas Dugdale, the Minister of Agriculture, paid tribute to the grassland research carried out at the station, which had given grass fuller recognition as one of this country's most important crops. In arable farming the introduction of hormone weedkillers had changed our cornfields from red and yellow in the summer to the much more productive green. With the agricultural research of Government bodies and commercial interests running parallel to attain still higher yields he would not be surprised if farmers were able to exceed the target of at least 60 per cent. increase over pre-war output by 1956 which the Government had set.

Dr. A. Fleck, Chairman of Imperial Chemical Industries, Limited, presided at the luncheon.

National Veterinary Benevolent and Mutual Defence Society

ANNUAL GENERAL MEETING IN MANCHESTER

The annual general meeting of the National Veterinary Benevolent and Mutual Defence Society was held at the Midland Hotel, Manchester, on Thursday, June 11th, 1953, with Mr. John Holroyd, President of the Society, as Chairman.

Minutes.—The minutes of the last annual general meeting were read and confirmed.

President's Review.—In opening the meeting the President gave a brief review of the Society's activities for the year to December 31st, 1952, and extended thanks to all those who had given of their time, services, financial assistance or support in carrying out the work of the Society. Mr. Holroyd referred to the change in the officers of the Society which had occurred following the decision of Major Hopkin to relinquish the Hon. Secretaryship and to restrict his future activities to the Hon. Treasurership only. He paid tribute to the long and loyal service given by Major Hopkin and the late Mrs. Hopkin, and said he was pleased to report that Major Hopkin would continue his association with the Society on the financial side, where he would be responsible for all matters relating to membership and subscriptions and to the assessment and payment of Benevolent Fund grants. Mr. Holroyd expressed his pleasure in introducing Mr. G. R. Sumner as Hon. Secretary: from the services already rendered by him in that capacity the President was satisfied that all Defence Fund matters would continue to receive prompt and careful attention.

Accounts.—In presenting the accounts for the year, Major Hopkin drew attention to the strengthening of the Defence Fund by the addition of £2,502 to the Capital Account. The Defence Fund now had a reserve of nearly £15,000 but it was intended that this should be further increased to provide against all possible contingencies. The Benevolent Fund accounts again showed a surplus of income over expenditure and Major Hopkin repeated his request that all cases of difficulty or distress should be reported immediately to enable the fund to be used to its fullest extent. The accounts were unanimously adopted and it was agreed that a copy thereof should be circulated to all members.

Hon. Secretary's Report.—Mr. G. R. Sumner, the Hon. Secretary, submitted his annual report for 1952 in which it was recorded that 38 Defence Fund claims had been received during the year. An analysis of these had been circulated to all members, together with a brief résumé of some of the more important cases arising during the year. The report also recorded that a donation of 50 guineas had been made by the Society to the H. W. Steele-Bodger Memorial Fund. The Hon. Secretary's report concluded with a reference to other small matters dealt with during the year and the report was unanimously received and adopted.

Officers for 1953-54.—The officials appointed for the year 1953-54 were as follows:—

President.—Mr. J. Holroyd.

Vice-Presidents.—Mr. H. Sumner and Mr. A. H. Watson.

Hon. Treasurer.—Major F. Hopkin.

Hon Secretary.—Mr. Sumner, junior.

Assistant Secretary and Treasurer.—Mr. W. E. Johnson.

Auditors.—Messrs. Litton, Pownall, Blakey and Higson.

Council.—Mrs. E. H. Shaw, Miss Brancker, Messrs. J. Adamson, junior, F. Beckett, E. R. Callender, C. W. Cartwright, H. W. Dawes, O. V. Gunning, H. Holroyd, D. E.

(*Concluded at foot of col. 1, page* 490)

MEMOIR

JOHN HOLROYD, F.R.C.V.S., D.V.S.M. (Vict.)

It is my sad duty to record the passing of a great veterinarian, a great colleague and a great friend.

Mr. John Holroyd, who passed away on July 20th, was not only a whole-hearted servant but an ornament to the profession to which he always felt it an honour to belong and which he always tried to serve to the limit of his ability.

The son of Mr. Henry Holroyd, an esteemed and respected veterinary surgeon, of Blackburn, he was educated at Ashville College, Harrogate, and later became one of the early students at the School of Veterinary Science, Liverpool University, from which he obtained his membership diploma of the Royal College of Veterinary Surgeons in 1909.

Thus early in his life the necessity of the scientific approach to the practice of his profession was clearly apparent to him, and after less than two years in practice with his father he took the courses of study leading up to the D.V.S.M. (Vict.) under the great personality of the period, Professor Sheridan Delepine; he remained ever conscious of the width of vision and broad outlook of that great teacher.

After a further period in practice he was awarded the fellowship diploma of the Royal College in 1914.

Very early in his professional life John Holroyd became an active member of the Lancashire Veterinary Association and was happy and content to serve the Association in any sphere or capacity. Later, whilst a comparatively young member, he was chosen as President of the "Lancashire" in 1927, and his year of office was so marked by his own estimable qualities and the stamp of his personal abilities that he was again asked to fill the Presidential chair in 1937, which he did with distinction to himself and the Association.

His urge to serve was still not satisfied and he was elected a member of the Council, R.C.V.S., in 1927, continuing his service through that body until 1946 when ill health forced his retirement.

During the anxious war period he held the high office of President, R.C.V.S., 1940-42 and guided the activities of the Council with kindliness, firmness and clarity.

Another outlet for his real anxiety to help his fellows was the National Veterinary Benevolent and Mutual Defence Society, of which he became a member early in his professional life, later to become President. It was due to his foresight and vision, allied to the driving force of his personality, that the defence side of the activities of the Society was completely reorganised so that it now offers a source of mutual help and assistance much appreciated by veterinary surgeons engaged in practice.

Of the man himself, much can and no doubt will be said by others more capable of expressing their thoughts than I.

One's first thought in thinking of John Holroyd in retrospect is the dauntless courage and indomitable resolution he showed in facing the cruel affliction of rheumatoid arthritis which he bore so gallantly and uncomplainingly for 20 years. Every advance of the condition was contested with consummate bravery and will power, before the advance was conceded, and it was a sad parting when he had at last to admit he could no longer fulfil his obligations to the R.C.V.S. and perforce to retire from the Council.

Engaged in practice all his professional life, he retained a progressive and scientific outlook to a remarkable degree, was a deep and voluminous reader with a keenly academical and analytical brain. I have often marvelled at the ease and ability with which he would go through a file of documents, sifting the wheat from the chaff—a process accompanied, if merited, by the most scathing comments.

It may well be said that John Holroyd was a typical product of the county of his birth, insomuch that under rather a quiet and unassuming exterior there was a strength and determination that had to be experienced to be believed, allied always with a kindliness and generosity of heart which was almost embarrassing at times on account of its real sincerity and deep feeling. No one who ever did him the smallest service went without the most appreciative thanks. An outstanding facet of the man himself was his integrity, which was as forthright as was his speech and outlook; in fact, the directness of his approach could be positively frightening to those meeting him for the first time.

Nothing could be easier than to anticipate his reaction to any given problem or situation. If he felt that any line of action fulfilled his high standard of propriety then the project had the full support and drive of his very being till the object was achieved, obstacles existing only to be overcome; on the other hand, if a project did not appeal to his sense of rightness, his utter disinterestedness was complete and shattering in the extreme to the proponents of the scheme!

His concept of service was of the highest as it was so completely unselfish, self-aggrandisement in any form being so alien to his nature. His service continued to the very end.

No mention of the passing of John Holroyd could be considered in any way complete without reference to Mrs. Holroyd and Betty. Throughout his long illness their devotion, loving care and patience with one who was quite justifiably at times rather a querulous patient, was something very beautiful to behold for those privileged to see it. The courage, spirit and bravery of John Holroyd was fully matched by their own. They have not been content to profess their Christianity, truly they have lived it.

It was indeed a sad group of veterinary surgeons that followed him with his family to the last resting place, but we came away feeling that a gallant soul was now at rest.

John Holroyd passed my way and I am the better for it.

H. S.

. . . . .

A Personal Tribute

E. R. C. writes: The sad news of John Holroyd's passing would come as a great shock to his many friends throughout the profession; I take this opportunity of recording my appreciation of a much valued friendship, knowing full well that others more qualified than I will pay tribute to this great man.

It was my privilege to enjoy his friendship for a good many years, and during most of the time I have known him he has been seriously incapacitated as a result of arthritis. The fact that he was able to overcome this disability and lead an extremely busy life is a great tribute to his courage and fortitude; although

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Leaske, W. R. McKinna, J. W. Procter, R. F. Ross, C. F. Shawcross, W. K. Townson, A. J. Wright, H. M. Wilson and T. Wilson.

Other Business.—Under this heading a proposition to include a list of all members with the annual report was adopted.

Before closing the meeting the PRESIDENT expressed thanks to the British Veterinary Association for publicity facilities afforded to the Society through the medium of *The Veterinary Record*.

suffering, at times severely, one rarely heard a word of complaint, and the amount of work he managed to get through was truly amazing. He did a tremendous amount for the profession which he loved, seeking no reward other than the satisfaction of rendering valuable service to his fellow men, and few people outside his circle of friends realise how greatly the profession, as a whole, are indebted to him.

John Holroyd was an excellent example of a forthright Lancastrian; sound in his judgment, he was ever ready to place his great wisdom and experience at the disposal of those needing advice or assistance. It is not my intention to enlarge on his academic attainments or his ability as a veterinarian; others more competent will do that; I feel sure, however, that he will be remembered as one of the really great Presidents of the Royal College of Veterinary Surgeons.

Almost to the end he retained his intense interest in matters concerning the veterinary profession; I spent an hour with him a few days before he took his last journey to his beloved Isle of Man, little realising that it was my last meeting with him. He will be greatly missed; and I personally feel a great sense of loss.

Sincere sympathy to his family will be extended in the grievous loss they have sustained.

The Funeral

The funeral took place on Thursday, July 23rd, and after a private service at his home in Blackburn he was interred in the family vault in Blackburn cemetery. The service was conducted by the Reverend J. T. Riddall, of Blackburn. The attendance was evidence of the high esteem in which he was held; in addition to family mourners and friends, the following members of the profession were present: Mr. H. Sumner, representing the President and Council of the Royal College of Veterinary Surgeons; Mr. E. R. Callender, representing the President and Council of the British Veterinary Association; Mr. J. W. Wilson, representing the Animal Health Division of the Ministry of Agriculture and Fisheries; Mr. F. Hopkin, representing the National Veterinary Benevolent and Mutual Defence Society; Mr. J. Adamson, representing the Lancashire Veterinary Association; Mr. W. R. McKinna (also representing Mr. A. Watson), Mr. G. H. Locke, Mr. R. H. Oddie, Mr. H. R. Hewetson, Mr. C. F. Shawcross, Mr. D. E. Leask and Mr. A. H. Hogg. Miss B. Corbett and Mr. S. F. Myerscough, of the veterinary staff of Messrs. Holroyd, were also present.

During the course of his address, the Reverend J. T. Riddall paid tribute to one who, despite serious physical handicap towards the close of his life, has always taken a full and active interest in his profession and in all matters concerning its welfare. He rightly pointed out that John Holroyd's influence upon the affairs of the Royal College of Veterinary Surgeons has been of the utmost importance and benefit to his associates.

From 1940 to 1942, during the difficult days of the war, he was President of the College, and for 25 years had been a member of its Council. More recently he had devoted his talent and organising ability to the affairs of the National Veterinary Benevolent and Mutual Defence Society, of which he was President at the time of his death.

His service to his profession, it was stated, had brought him into contact with many people and from all he gained deep respect and affection. Tributes from friends, which were read, conveyed ample evidence of the respect and admiration in which he was universally held.

There was a large number of beautiful floral tributes, including those from the President and Council of the Royal College of Veterinary Surgeons, the President and Council of the British Veterinary Association, the Lancashire Veterinary Association and the National Veterinary Benevolent and Mutual Defence Society.

DENTAL DECAY: SUGGESTED ADDITION OF FLUORIDE TO PIPED WATER

The addition of small amounts of fluoride to piped water supplies to reduce dental decay is favoured by the United Kingdom mission which last year went to the United States and Canada to study the effects of fluoridation. They recommended that before the practice is generally adopted in this country carefully controlled investigations in selected areas should be undertaken. These would serve as "study centres" and include periodic medical and dental examinations of all ages.

The report, submitted to the Minister of Health, the Secretary of State for Scotland, and the Minister of Housing and Local Government, is published by the Stationery Office at 5s.

IN PARLIAMENT

Artificial Insemination of Cattle

In the House of Commons on Thursday of last week, on the motion for the adjournment, Mr. Hugh Fraser raised "the technical matter of artificial insemination of cattle, the new deep-freeze technique being perfected now at Cambridge, and the export and import of cattle semen." Artificial insemination offered fascinating possibilities, but also had its dangers. The best could be the enemy of the good. We were seeing a conflict arising between the user and consumer of bulls as breeding animals. Until now this possible conflict of artificial insemination had to some extent been hidden by the limitations of present use. But recently there had arisen this new and revolutionary technique of a most far-reaching kind by which it was possible to preserve the semen not for a few days but for a matter of at least 15 months, it might be for 15 years and for all we knew for 150 years and more. At the same time it was possible for the semen to be further diluted and, therefore, make it more effective in its general action.

This technique, which was in the process of perfection around Cambridge by the Artificial Research Council and those working with them, undoubtedly must have far-reaching results. At the same time the Government had to consider the Oaksey Report, published in 1952, and on which they had not yet come to any decision—the Report advocating the control of the export and import of cattle semen into this country. He believed that we were at a stage where the Government must undertake a more general review of the whole question of artificial insemination: not only the Oaksey Report, not only this new development, but also the whole issue of how the lines of breeding in this country were best to be preserved.

"Artificial insemination has undoubtedly provided a great benefit. A.I. centres have done much good by up-grading the poorer cattle and providing the use of bulls far superior to those available naturally to the small farmer. But we must consider the effect of this new technique. Until now artificial insemination has been limited by the fact of the full efficient use by domestic cows of the bull only once in three weeks, while, of course, the semen lasts only for a comparatively short period. As farmers whose cows are served in the winter are aware, that period is much reduced in the winter months. There has to be a conjunction, which is sometimes difficult to effect merely from the point of view of timing, between the service of the bull and the time when the cow is herself ready for service. This will all be overcome by the new technique. The technique is extremely simple in bringing the temperature of the semen from minus 69 degrees to that of blood temperature. It means that in the future the farmer will not be faced with this old problem.

"Those advantages are obviously of importance, and I wish to point out a few more of the advantages which this new technique makes available. As regards foot-and-mouth disease, the advantage will be considerable. Banks of semen can be built up which will last in deep-freezing conditions for a long period, and which can definitely be declared clear of any infection. The same, of course, will apply to certain other diseases which, as hon. Members know, have a considerable effect on milk herds.

"It will have obvious advantages as regards quarantine and the export of blood. It will mean that it will be possible, when there is a complete embargo, to send blood in the form of semen overseas. It offers great possibilities for use in tropical areas where for technical reasons it would be difficult to maintain British livestock, where British development would be of great value and cannot otherwise be used.

"It will also mean that reserves of semen can be built up so that the problem of whether a bull is proven or not can be overcome. It will mean that a far wider choice of strains can be made by the farmer than is available to him to-day. It will mean that historical breeding can be carried out, using the blood of bulls which have long been dead. There is no reason to believe that it will not be possible to miss a generation, if need be, and throw back by artificial means to two or three generations behind the contemporary generation."

These advantages were clear, but so were some of the dangers, and it was these dangers that necessitated control. There was the obvious danger of encouraging the tendency of too close inbreeding, or over-breeding. Even to-day, with artificial insemination used in its present technique—which was not the fully developed technique—the fact that 4,000 cows could be served by one bull in one year was in itself a point which must eventually have a bad effect on our stock.

"At the moment the farmer going to an A.I. centre is limited in his choice of bull by the time factor of a week or so, to which

I have already referred. Under the new dispensation every farmer will be able to apply for the best bull, and the best may be the enemy of the good. The variation which is so essential to constant improvement may be limited, blood lines will be reduced and the improvement of stock retarded or even adversely affected."

The fundamental and effective excellence of Britain's cattle must depend upon the producer of pedigree livestock and not upon the Milk Marketing Board or the commercial producer. What would be the effect on the producer of pedigree bulls and cattle if a system was allowed to develop uncontrolled, which could make every quantum of semen go much further by dilution, and could substitute the export of a flask worth a few pounds, or even shillings, for the export of a bull worth thousands of pounds? He believed that the first thing that should be done, and done quickly, was that there should be consultations by the Ministry with all sides of the industry, namely, the commercial producers, the exporters and those actually producing pedigree livestock. The hands of the Minister's husbandry officers must be strengthened. " In many countries there is linked with the Ministry of Agriculture a department of livestock. Greater strength could be given to that department. People inside the Ministry feel that this department does not carry the weight that it should. It could do something to limit the unlimited use of bulls by the Milk Marketing Board, and it is essential that the breed societies should be consulted in regard to export of semen."

A possible solution of this difficulty was the formation of a non-profit making body consisting of the Ministry, the breed societies and the Milk Marketing Board, and associated with it the animal genetic sections of the Agricultural Research Council, under an independent chairman. That sort of organisation could cope with the question of the export and import of semen.

The Reply

The Joint Parliamentary Secretary to the Ministry of Agriculture (Mr. G. R. H. Nugent), replying, said that his right hon. Friend the Minister had, under the Act of 1943, a specific statutory duty to be responsible for the use of artificial insemination, and in this context, on the question of export, he had been assisted by the Report of the Oaksey Committee and the Minister had decided that it was in the best interests of the livestock industry to invite the opinions of the various leading agricultural bodies and breed societies on the recommendations of the Report. " It is exactly what my hon. Friend has suggested he should do. It is taking some time for these various bodies to reach their conclusions and communicate with my right hon. Friend and the Secretary of State for Scotland. We have not yet received them.

" But I think it is perhaps sufficient to say now, as indeed everyone outside the House and many in the House know, that there is a deep division of opinion upon it. There are those who feel that to allow the export of deep-frozen semen is the right thing to do because, as my hon. Friend has said, it is a trade which is coming anyhow, and, as he puts it, we would simply be Canute-like if we denied it and prevented it developing here. Then there are others who say with equal cogency—and these particularly include the beef breed societies—that to allow it will perhaps destroy the living of many pedigree beef breeders.

" The influence of artificial insemination on our livestock, and our cattle in particular, is, of course, already making itself felt in a very significant manner. To date, in the last 10 or 12 years the development of artificial insemination in this country has been wholly beneficial. It has been based on a great variety of breeding strains, and, therefore, the dangers that he rightly, in my view, adumbrated have not occurred. The dangers lie in the future.

" I think, however, that there is no doubt that the influence of artificial insemination will steadily increase. Already something like a third of our cows—1,000,000—are annually inseminated, and, of course, the direct benefit from that in higher milk yields has been most remarkable. Year by year now we see the average yield per cow going up, and I have no doubt at all that the main influence in that significant and most welcome improvement in average milk yield is undoubtedly artificial insemination —the replacement of the old, and in many cases, scrub bulls that used to serve the small herds up and down the country, by the high-grade bull from the artificial insemination centre.

" That has produced a better cow in the first generation and a better one still in the next generation. So, progressively, we are seeing our dairy herds in particular improving. I quite agree with my hon. Friend, especially with the development of this deep-freeze technique, which is, incidentally, a great credit to our scientists—in this matter we have led the world—that that in itself will make it possible to intensify the use of the selected bulls. For how long we shall be able to keep the semen active no one can yet say. All we can say is that it is being successfully kept active for a period of 12 to 15 months, but it may very well be, as my hon. Friend said, that it will be kept active for a very much longer period. And in this picture, both the selection and the management of bulls standing at A.I. centres will be of steadily increasing importance. It will be a very great problem to keep the right balance between what the farmer wants and avoiding the continual services from the same bulls.

" I think it worth while to point out the necessity to combine the right livestock management with the right commercial policy in the buying, because if the steadily increasing buying power of the artificial insemination centres tends to reduce the number of pedigree breeders that we have then they may find that they are ultimately killing the goose that lays the golden egg. It is essential that their buying policy should be such that we shall retain in active and sound possession a sufficient number of pedigree herds in this country, so that we have the necessary variety of strains. Those are problems that my right hon. Friend's Advisory Committee on Artificial Insemination have begun to study. I cannot say we have by any means found a solution to them, but that body, under my noble Friend in another place, have begun to consider this very wide and difficult problem.

" I can only assure my hon. Friend that we shall study this problem with the very greatest attention, and that both in taking the decision on the Oaksey Report and in the general problem of the management of A.I., we shall bear in mind the wise words which he has uttered to-night. They will, I am sure, be of considerable value both in the House and in the farming world."

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Protection of Animals (Amendment) Bill

In the House of Lords on Tuesday last, Lord Stamp presented a Bill to repeal the Animals Anaesthetics Act of 1919 and to extend the provisions of the Protection of Animals Acts of 1911 and 1933 in relation to the performing of operations on animals. The Bill was read a first time.

[The effect of this Bill, for the promotion of which the British Veterinary Association was responsible, is to provide that all surgical operations upon animals (with a few specific minor exceptions) shall be carried out under the influence of anaesthetics, it being left to the veterinary surgeon to decide what specific agent he will use, and how it shall be administered.]

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Questions

Veterinary Surgeons and National Service

In the House of Lords on July 21st, Lord Ogmore asked Her Majesty's Government whether, in view of the fact that they are calling up recently qualified veterinary surgeons in the United Kingdom for national service in various arms other than the Royal Army Veterinary Corps, in which there are no vacancies, and in view of the shortage of qualified veterinary surgeons in British Colonial territories, they will, in the national interest, make the necessary arrangements to allow those veterinary surgeons who wish to do so to carry out their period of national service by secondment from the Army as veterinary officers in one or other of the Colonial territories.

The Joint Parliamentary Under-Secretary of State for the Home Department (Lord Lloyd): The special arrangements for suspending the call-up of veterinary graduates have been terminated this year because it is felt that they can no longer be justified. Graduates completing their studies this year will accordingly be called up, but they will all be offered the opportunity of service in the Royal Army Veterinary Corps. The numbers concerned this year will not, I understand, exceed 33. Since 1949 veterinary work in the Colonies has been recognised as justifying deferment under different arrangements and it is not proposed to withdraw this concession. Any veterinary graduates qualifying this year who are accepted by the Colonial Office for the Colonial Veterinary Service can therefore have their calling up deferred, so long as they continue in this employment.

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Cattle (Dis-horning)

Mr. de Freitas (July 17th) asked the Minister of Agriculture whether he will give greater encouragement to the practice of dis-horning cattle.

Sir T. Dugdale: My Department has been advocating the dis-horning of cattle for many years. Officers of the National Agricultural Advisory Service take every opportunity of encouraging farmers to dis-horn cattle in commercial herds, particularly where the cattle are likely to be kept in yards. A leaflet has been issued on the methods of dis-horning and the livestock officers are always ready to give advice.

Swine Fever

Mr. Bartley (July 22nd) asked the Minister of Agriculture the number of pigs which have been affected by swine fever this year; the number which have been lost; and the number which have recovered from the disease.

Mr. Nugent: No figures are available of the number of pigs affected by swine fever or of the number that recover. This year there have been 1,868 outbreaks in Great Britain and about 13,000 deaths from the disease have so far been recorded. This excludes deaths that have occurred on premises where movement restrictions are still in force, figures for which are not yet available.

Slaughter of Horses (Report)

Mr. E. Johnson (July 27th) asked the Minister of Food when the report of the committee, sitting under the chairmanship of the Duke of Northumberland, to investigate the slaughter of horses, will be published.

Major Lloyd George: The report will be published as a White Paper towards the end of August.

NOTES AND NEWS

Diary of Events

Aug. 9th—15th.—XVth International Veterinary Congress, Stockholm, Sweden.

Sept. 6th—12th.—Seventy-first Annual General Meeting and Congress of the British Veterinary Association, at Aberdeen.

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THE ABERDEEN CONGRESS

With this issue is distributed to members B.V.A. the form of application for tickets for the various functions, excursions, etc., to be held during Congress week. This form should be completed and returned to the General Secretary, at 36, Gordon Square, London, W.C.1, *as soon as possible and not later than Saturday, August 29th.*

A revised programme and a list of hotels again are reproduced and below will be found some further information of interest to those intending to visit Aberdeen.

Banquet Guests

We feel sure members will be interested to hear that the Secretary of State for Scotland (Rt. Hon. James Stuart, M.P.) and the Minister of Agriculture and Fisheries (the Rt. Hon. Sir Thomas Dugdale) will be among the Association's guests at the Banquet on September 9th, and that they have both accepted invitations to speak.

Arrangements for Ladies

Apart from the evening social events, some additional entertainment has been arranged for ladies accompanying members at the B.V.A. Congress. The local arrangements are in the hands of Mrs. Service, Ellon, assisted by Mrs. Argo, Aberdeen.

The route of the ladies' excursion on the Tuesday of Congress week, to Paradise Woods and Alford, lies largely over country roads. It follows the course of the River Don, and includes a number of the most famous beauty spots.

On the Wednesday a visit has been arranged (for limited numbers only) to Grandholm Tweed Mills. Here the whole process of the transformation of wool into finished tweed can be followed stage by stage—a fascinating experience. While the visit clashes in time with the public proceedings of the annual general meeting of the B.V.A., it has been thought advisable to give the ladies an opportunity of participating in this outstanding attraction, which is not normally available to visitors to Aberdeen.

On the Thursday the main Congress excursion visits Braemar by way of Royal Deeside, which is usually at its loveliest in the autumn. The return route follows the South Deeside Road, and passes the famous salmon leap at the Brig o' Feugh. Alternatively, the more energetic ladies may wish to join some of the menfolk in a round of golf over the Royal Aberdeen course at Balgownie.

A second ladies' excursion has been arranged for the Friday afternoon. This is to the 15th-century Crathes Castle and its magnificent gardens, and—especially if the weather be kind—should provide an enjoyable and relaxing afternoon.

For reasons of accommodation, the official Congress visits and demonstrations on the Tuesday and Friday afternoons have had to be confined to members only, but in addition to the organised activities just described, our ladies will find no lack of other entertainment. Tours of the city and environs leave at frequent intervals each day, while the city public parks and gardens are always a delight, especially if parents bring young children.

And there are always the shops!

Hotel Accommodation in Aberdeen

Intending visitors who have not yet made their arrangements are asked to note that the options for block-booked rooms in certain of the best hotels, obtained by the Local Secretary for members of the B.V.A. and their families, expire on August 8th. It is consequently essential that definite bookings be made *immediately*.

While no block-booked accommodation remains in the Caledonian or Northern Hotels, there is still, at the time of writing, accommodation at the Gloucester, Imperial, Station, Douglas and Marcliffe Hotels. There are, however, no single rooms still available at the Gloucester or Marcliffe. Indeed, because of the general scarcity of single rooms, it would assist if members desiring single accommodation made arrangements with friends to share twin-bedded rooms.

It is also believed that accommodation of all classes remains available in most of the other hotels included in the list of hotels, which is reprinted in this issue.

Members are asked to make their own individual arrangements with the hotel of their choice. In case of real difficulty they should refer the matter to the Interim Local Secretary, Mr. L. G. Donald, B.Sc., M.R.C.V.S., Mill of Craibstone, Bucksburn, Aberdeenshire.

Congress Local Secretary

During the first three weeks in August Mr. L. G. Donald, B.Sc., M.R.C.V.S., Mill of Craibstone, Bucksburn, Aberdeenshire (Telephone: Bucksburn 94), will be acting as Interim Local Secretary, in the absence of Dr. Alastair Greig.

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Antibiotics in Pig Food*

In October, 1951, the Agricultural Research Council called a meeting to decide whether the knowledge then available on the subject of the growth-promoting effect of antibiotics was sufficient to justify amendment of the Penicillin Act of 1947.

It was felt then that British experience was too limited to allow a decision to be taken, as it was recognised that British and American methods of pig feeding were often very different and the results obtained in one country could not necessarily be translated to the other.

The Council, therefore, decided to initiate further experiments

* A.R.C. Report series No. 13, H.M.S.O., 1953, price 1s. 6d. net.

and the report, just published, gives the main findings of these trials.

The experiments were conducted at six centres covering 11 experimental series and involving 512 fattening pigs. The report gives details of the experimental arrangements, management, feeding and breed of pigs used. The antibiotics used were procaine penicillin and aureomycin (in the form of Aurofac 2A), and in most experiments vitamin B_{12} was also added with the antibiotic.

Comparisons were made between the effects of the two antibiotics when used with a basal ration containing vegetable protein only, and one which was supplemented with fish meal.

The two types of diet were tested in two systems of feeding, the all-meal system, and the Lehmann system, in which a constant daily quantity of a meal mixture containing some animal protein is supplemented with a gradually increasing amount of a home-grown bulky feed.

The effects of the various diets were assessed by comparing live-weight gain and food conversion. Most of the pigs were slaughtered at one factory and the carcases were graded by Mr. Collan Brett.

The experiments proved conclusively that both aureomycin and penicillin, added to the diet of fattening pigs in the presence of an adequate amount of vitamin B_{12}, increased growth rate and improved the efficiency of food conversion.

The amounts of antibiotic used varied from 4·5 g. per ton to 224 g. per ton of procaine penicillin, and from 9 g. per ton to 28·8 g. per ton of aureomycin. The report admits that the amount of antibiotic used may have been unnecessarily large and mentions that further experiments on the effect of variable dosage on growth rate and food conversion have now been begun at two centres.

The increase in daily live-weight gain averaged about 10 per cent. in pigs on a diet which included fish meal, and about 14 per cent. in pigs on a diet of vegetable protein. There was an improvement in food conversion efficiency of 6 to 7 per cent. with both types of diet.

In nearly all the experiments the two antibiotics did not differ significantly in their effect but at one centre where *ad lib.* feeding was used aureomycin showed some advantage over penicillin. Results of the carcase gradings showed that the inclusion of the antibiotics in the food had no effect on carcase quality.

The report points out that the economic value of antibiotic supplements to the individual farmer will depend on the degree of improvement he obtains under his own conditions, and on the cost of the antibiotic. It is suggested that the average pig fattener may not be able to take full advantage of the increased growth rate giving an increased through-put of a fattening house, but he should be able to obtain more positive commercial benefit from the improvement in food conversion.

Apart from the experiments on fattening pigs, the report deals briefly with an experiment to determine the effect on weaning weight of including antibiotics in creep feed. This trial, which covered 208 litters of suckling pigs on 13 farms, gave indication of a beneficial effect on the weaning weight, but the results were not statistically significant. Results obtained were very variable, probably because of the wide difference of conditions between the farms, and it was not possible to draw any definite conclusions.

This report will be welcomed by the profession and by the agricultural community in general. Apart from the definite information which it provides, it is a clear indication of the very great value of co-operative research. This is an instance where official research centres, industrial research bodies, and manufacturers have worked together for the benefit of agriculture, and a glance at the "acknowledgments" section of this report will show how many have joined in this co-operative effort.

The experiments were designed and analysed, under the guidance of Dr. F. Yates, F.R.S., by Mr. R. C. Campbell, of the A.R.C. Unit of Animal Reproduction, and Mr. M. H. Westmacott, of the Statistics Department, Rothamsted Experimental Station.

H. E. H.

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Use of Toxic Chemicals in Agriculture

The Ministry of Agriculture and Fisheries has appointed a Working Party on Precautionary Measures against Toxic Chemicals used in Agriculture: Risks to Wild Life, with the following terms of reference:—

"To investigate the possible risks to the natural flora and fauna of the countryside from the use in agriculture of toxic substances, including the possible harmful effects for agriculture and fisheries, and to make recommendations."

The Ministry has asked the B.V.A. for any information in this connection which may be of use to the Working Party and the matter was briefly discussed by the Technical Development Committee at a recent meeting. As a first step it was decided to seek evidence from members through the columns of *The Veterinary Record* in order that a collated report may be prepared for submission to the Ministry at an early date.

Would any member with experiences to report, kindly do so to the General Secretary, B.V.A., 36, Gordon Square, London, W.C.1, as early as possible.

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PERSONAL

Birth.—Pyke.—On July 19th, 1953, at Blackburn, to Marie (*née* Monk) and Brian Pyke, M.S., R.C.V.S., a son.

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Appointment.—Mr. B. V. Jones, M.R.C.V.S., has been appointed adviser to the Veterinary Division of Allen & Hanbury's Ltd.

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Ministry's Veterinary Field Staff Appointments.—The following have been appointed to the permanent staff as Veterinary Officers: Mr. E. Beaumont, M.R.C.V.S., D.V.S.M. (stationed at Hertford); Mr. H. T. J. Evans, M.R.C.V.S. (stationed at Carmarthen), and Mr. K. M. Tyrrell, M.R.C.V.S., B.A., B.Sc. (stationed at Dorchester).

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Mr. J. C. Buxton's Doctorate.—Mr. J. C. Buxton, B.Sc., M.R.C.V.S., Veterinary Investigation Officer, Sutton Bonington, was recently awarded a Ph.D. degree at the University of Nottingham.

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B.M.A. President.—Sir John McNee, of Glasgow, has been elected President of the British Medical Association for 1954-55. Because of the joint annual meeting with the Canadian Medical Association in Toronto in 1955, Dr. T. C. Routley, of Toronto, has been elected President for 1955-56.

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Veterinary Work in Singapore.—We understand that the R.S.P.C.A. have been asked to assist their Overseas Branch in Singapore in finding a veterinary surgeon to take up practice there and to co-operate with the Branch in its efforts to attend to animals of the poor. Cost of passage likely to be met, and help given in obtaining equipment and accommodation. Anyone interested should contact the Chief Secretary, R.S.P.C.A., 105, Jermyn Street, S.W.1, who will furnish any further particulars required.

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INTERNATIONAL HORSE SHOW

Miss Delfosse Receives the Queen Elizabeth II Cup from Her Majesty

In our last issue, writing just after the event, we recorded the splendid achievement of Miss Marie Delfosse, M.R.C.V.S., of Northwood, Middlesex, in crowning a run of 20 victories this season by winning the Queen Elizabeth II Cup at the White City in the chief international event for women riders. On the bay mare Fanny Rosa she took her 12 fences without loss of points in 86 seconds. On the evening of that day (Tuesday) Miss Delfosse received the cup from the hands of the Queen.

A similar honour was accorded Lieut.-Colonel H. M. Llewellyn, most popular winner, on Foxhunter, of one of the sternest contests on record for the King George V international individual championship.

On the Thursday Britain won the Prince of Wales Cup for international team jumping for the fifth year in succession. The course was 892 yards with 14 jumps, of which the sleepers, at the wettest corner of the arena, and the triple, awkwardly spaced, caused most of the trouble. Miss Smythe on Tosca scored in each round for Britain. There were only five clear rounds in the whole afternoon, of which Foxhunter performed one most brilliantly. As Britain was then sure of victory Mr. White, the captain, decided not to ask Lieut.-Colonel Llewellyn to jump again. Britain's final score was 32. Ireland was second with 48¾, France third with 53¾, and Italy fourth with 56.

The Hunter championship gave Mr. Cooper's wonderful heavyweight Mighty Atom his fourth successive victory at the White City. Reserve champion was Mr. J. R. Hindley's Somewhere,

the bay middleweight who is coming to his best. Mr. Summerhays was called in as referee to decide the harness Horse championship between Sir N. Colman's Black Magic of Nork and Mr. Barton's bay stallion Walton Diplomat, and finally the referee supported the decision of the judges on Tuesday night and upheld Walton Diplomat.

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ROYAL COLLEGE OF VETERINARY SURGEONS

MEMBERSHIP EXAMINATIONS, JUNE/JULY, 1953

LIST OF SUCCESSFUL CANDIDATES

(*Concluded*)

Dublin

SECOND EXAMINATION

Physiology only

Boyd, J. R.	Nolan, J. J.
Clarke, J. P.	O'Neill, T. J.
Fleming, A. R.	Roche, J. V.
Huey, J. A.	Stack, P. D. J.
Kent, D. K.	York, A. J.
Kilroy, K. S. M.	

Anatomy (including Histology)

Allen, R. S.	Lee, J. G.
Barnes, Thomas	Lowndes, J. D.
Cody, O. H. (credit)	McCarthy, William
Costello, E. A.	McDonald, W. E.
Cotter, William	Mangan, P. J.
Daly, D. J.	Moloney, J. B.
Dolan, T. C.	Murphy, P. A.
Ennis, Miss D. M. (credit)	Nolan, P. J.
Fallon, G. A.	O'Connor, J. J.
Handcock, W. J.	O'Driscoll, John
Hernon, John	O'Hare, M. B.
Hurley, J. D.	O'Mahony, Jeremiah
Hurley, T. J.	O'Sullivan, D. C.
Johnston, J. B.	O'Sullivan, F. J.
Kelleher, D. L.	Ryan, M. A.
Kelly, J. A.	Teevan, R. J. (credit)

THIRD EXAMINATION

Hygiene only

Broderick, T. I.	Harris, R. E.
Brownell, T. A.	McInerney, J. F.
Carroll, Miss Una	Mackessy, E. J.
Cawdery, M. J. H.	Nunn, W. R.
Conroy, P. J.	O'Brien, J. D. P.
Crowley, J. P.	Poole, D. B.
Dunne, L. G.	Smith, K. J.
Evans, J. A.	Smyth, L. J.
Fleury, A. T.	Stuart, N. C.
Gahan, M. A.	Wilson, D. J.
Harris, Miss M. D.	

Pathology only

Abrahamson, David (credit)	Keane, P. A.
Ballesty, J. J.	Kent, Martin
Byrne, J. G.	Liffey, P. K.
Fenlon, P. J.	Littlewort, M. C.
Flavin, M. J.	McDonald, P. J. (credit)
Foley, J. E.	Marsh, J. H.
Goold, M. C.	O'Brien, M. W.
Guerin, W. A.	O'Donnell, Owen
Guven, M. N. (credit)	O'Keeffe, D. J.
Hannan, John	Strickland, Kenneth (credit)
Harbord, R. S. (credit)	Twomey, Thomas
Houlihan, T. V.	Tynan, A. R.

FINAL EXAMINATION

Old Syllabus

O'Brien, M. G.	O'Byrne, T. F.

Revised Syllabus

Butler, G. M.	Lee, David
Carolan, E. S. E.	Linton, J. A. M.
Chapman, W. R.	McAuley, B. F.
Coghlan, D. P.	McCarthy, James
Conway, D. A.	McGinley, M. A.
Deeney, E. E.	Mulligan, T. D.
Driscoll, Cornelius	Nelson, W. A.
Gallery, G. J.	O'Connell, D. F.
Gilchrist, E. W.	O'Connor, Cormac
Hatch, Charles	O'Hara, D. P.
Hernon, P. C.	O'Hart, Patrick
Hurley, T. M.	O'Rourke, Daniel
Johnson, R. E.	Roche, Laurence

ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

ANTHRAX:

Dunbartonshire.—Cardross Mill Farm, Cardross, Dumbarton (July 20).

Northants.—Elmington, Oundle, Peterborough (July 22).

Wigtownshire.—Camrie Farm, Glen Luce, Newton Stewart (July 20).

FOWL PEST:

Beds.—3, Rotten Row and Rectory Fields, Riseley, Bedford (July 22).

Cambs.—Manor Farm, Milton, Cambridge (July 20).

Hants.—Wey Valley Farm, Standford, Bordon (July 23).

Herts.—Lilton, Steeple Morden, Royston (July 22); Hall Farm, Broadfield, Nr. Buntingford (July 23).

Leics.—50, Station Road, Countesthorpe, Leicester (July 20).

Middx.—10, Smallholding, Clockhouse Lane, Ashford (July 23).

Monmouthshire.—Tymawr Farm, Fwthog, Abergavenny (July 21); Maes Hafod, Blaina (July 22).

Yorks.—Overdale, Mytholmroyd, Halifax (July 21); 7, Manor Road, Wales, Sheffield (July 23).

SWINE FEVER:

Beds.—4, West End, Elston (July 25).

Berks.—Woodlands Farm, Lower Henley Road, Reading (July 24); Highclere Park, Highclere, Newbury (July 27).

Bucks.—Stanley Wood Pig Farm, Amersham (July 23).

Cambs.—Euximoor Drove, Christchurch, Wisbech (July 21); 28, Wimblington Road, March; Brick Kiln Farm, Chettisham (July 24).

Cornwall.—Penhale Farm, Ladock, Grampound Road; Tinney Hall, Lewannick, Launceston (July 22); Trembroath, Stithians, Truro (July 25); Higher Sutton, Upton Cross, Liskeard; Trewint Terrace, Trewint, Alternum, Launceston (July 27).

Denbighs.—Pennant Farm Mental Hospital, Denbigh (July 27).

Derbys.—The Croft, Station Road, Chellaston, Derby (July 23).

Devon.—Brentor View, Strowford, Lifton (July 21); Westacott Nurseries, Landkey, Barnstaple (July 27).

Essex.—Hovel's Farm, Southend Road, Fobbing, Stanford-le-Hope; Heath Place Farm, Orsett Heath (July 23); Belmont Farm, Meeson's Lane, Grays (July 27).

Herts.—Whiting's Hill Farm, May's Lane, Barnet (July 27).

Hunts.—Paxton Hill House, St. Neots (July 22); High Street, Warboys, Huntingdon (July 23).

Kent.—Kingsdown Fruit Farm, West Kingsdown, Kent (July 21); Silverdale Farm, Lordswood Lane, Chatham (July 23).

Lancs.—Elms Farm, White Field, Manchester (July 21); Higher Broadfield Farm, Heywood (July 23); Tanhouse Farm, Rishton, Blackburn; No. 7 Smallholding, Sherdley Road, St. Helens (July 27).

Leics.—Glebe Farm, Tugby, Leicester; Highdiekds Farm, Blaby, Leicester (July 27).

Lincs.—Moses Yard, Stenigat, Louth; Clough Farm, Croft, Skegness (July 24); Red House Farm, Station Road, Burgh-le-Marsh (July 27).

Middx.—Wallington Pig Farm, Ashgrove Road, Ashford (July 22).

Midlothian.—No. 12, Wester Hailes, Slateford, Edinburgh; Gogarbank, Corstorphine (July 27).

Northants.—Halfleet House, Market Deeping, Peterborough (July 23); Grassmoor Farm, Whittlesey, Peterborough (July 24).

Suffolk.—Pott's Farm, Layham, Hadleigh (July 22); Premises at Perry's Allotments, Cobholm, Great Yarmouth (July 23); Lower Green Farm, Satterley, Beccles; Water Lane, Rickinghall Superior (July 24); The Paddock, Calais Street, Hadleigh (July 27).

Surrey.—Hookstile House Farm, Byer's Lane, South Godstone (July 27).

Staffs.—Short Heath Farm, Blexwich Road North, Short Heath, Willenhall; 50, Essington Road, New Invention, Willenhall; Springhill Farm, Endington Road, Aldridge (July 27).

Yorks.—The Poplars, North Cawton, Richmond; Manor Farm, Saxton, Tadcaster (July 21); Sunnybank, Weeton, Leeds; Intake Farm, Holmpton Road, Hollym, Withernsea; Tanver Farm, Liversedge (July 23); Royds Hall Farm, Rothwell, Leeds (July 25).

* * * * *

SOME SWINE FEVER RESTRICTIONS REMOVED

On Tuesday last it was announced by the Ministry of Agriculture and Fisheries that outbreaks of swine fever have so far abated in the Yorkshire and West Midlands areas that it is now

possible to withdraw the special restrictions on markets and movements of pigs that have been in operation in those areas since April 27th under the Swine Fever (Infected Areas) Order of 1953. The Minister of Agriculture and Fisheries has accordingly made an Order* removing these restrictions as from July 29th in the following counties: the East and West Ridings of Yorkshire, Gloucestershire, Salop, Staffordshire, Warwickshire and Worcestershire.

The restrictions will remain in force for the time being in East Anglia, *i.e.*, in the counties of Essex, Norfolk and East and West Suffolk, where the fall in the number of outbreaks is not quite so marked.

The removal of restrictions in the Yorkshire and West Midlands areas does not affect the operation of the Regulation of Movements of Swine Order of 1950, which regulates the holding of markets and movements from markets and pig dealers' premises. This Order will remain in force throughout the whole of Great Britain.

* The Swine Fever (Infected Areas) (Amendment) Order, 1953.

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the B.V.A.

α-TOCOPHEROL ACETATE FOR MUSCULAR DYSTROPHY IN CALVES

Sir,—As a result of a talk which I had the pleasure of giving to the Technical Development Committee of the British Veterinary Association on my work on vitamin E deficiency in calves, I have received a number of enquiries as to the dose of α-tocopherol acetate which should be administered for the prevention and treatment of muscular dystrophy in calves. The dosage which we found successful for preventive purposes was 50 mg. daily given orally, and for treatment of calves already suffering from the disease 200 mg. The treatment for preventive purposes can be continued so long as there is any danger of deficiency, and that for calves already suffering from deficiency until the symptoms are alleviated, when the dose might be reduced to that suitable for prevention. These dosages give quite adequate safety margins under most circumstances. A maintenance dose of 50 mg., however, will not be quite sufficient if the calves are receiving 1 fl. oz. or more of cod-liver oil.—Yours faithfully, K. L. Blaxter, Hannah Dairy Research Institute, Kirkhill, Ayr. *July 14th*, 1953.

* * * * *

ACORN POISONING IN CATTLE

Sir,—We are investigating the problem of acorn poisoning in cattle and we should be very grateful to any of your readers who could put us in touch with natural cases. We should like the opportunity of making a *post-mortem* examination and of examining a specimen of the suspected acorns. Further, we should be interested to hear of cases that have occurred in recent years.—Yours faithfully, E. G. C. Clarke and E. Cotchin, Departments of Physiology and Pathology, Royal Veterinary College, London, N.W.1. *July 21st*, 1953.

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CHLOROMYCETIN IN THE TREATMENT OF FELINE ENTERITIS

Sir,—Recovery within a matter of hours has been observed in the undermentioned typical cases of feline enteritis, following treatment with chloramphenicol.

Case 1.—Tabby cat, tom, two years old. This cat had been ill for 48 hours. Temperature 104°, no appetite, very depressed, marked dehydration. Treatment, adopted at 6 p.m., consisted of the injection of 0·25 gramme chloramphenicol (Chloromycetin, Parke, Davis) dissolved in a 50 per cent. solution of N,N-dimethylacetamide.

The injection was made intramuscularly in the biceps femoris region. The patient was seen again at 4 p.m. next day. It had appeared much brighter that morning and eaten fish in the afternoon. A further injection of 1 c.c. (0·25 gramme) chloromycetin was followed by complete recovery.

Case 2.—Black and white castrated male cat, age three years. This cat had been listless on the previous day and was found in the morning to be seriously ill; it was deeply depressed, had no appetite, temperature 105°. At 12 noon 1 c.c. (0·25 gramme) of chloromycetin was injected intramuscularly. During the same afternoon the cat appeared more comfortable and ate fish at 6 p.m. No further treatment was necessary.

Case 3.—Black male kitten, six months old. Listless, complete loss of appetite, temperature 104°. This animal appeared normal on the previous day and was found ill in the morning. At 2 p.m. a 0·25 gramme capsule of chloromycetin was given *per os*. Recovery was complete the following morning.

Case 4.—Black male cat, castrated, aged two years. This cat was seen at 11 a.m. Illness had been noticed during the previous 24 hours, with frequent emesis, loss of appetite, dehydration, deep depression, temperature 104°. Chloromycetin (0·25 gramme) injected intramuscularly. At 10 p.m. the owner telephoned to say that the cat was worse and was now vomiting blood. Next day at 10.30 a.m. the cat was a little better and a further 0·25 gramme chloromycetin was injected intramuscularly. This was followed by complete recovery on the following day.

Other cases showing symptoms of feline influenza have given a varying response to chloromycetin treatment, and spontaneous recovery occurred in only one case treated solely with this drug.

Acknowledgment.—Supplies of chloromycetin for the above investigation were kindly made available by Department of Clinical Investigation (London), Parke, Davis & Co. Ltd.—Yours faithfully, James Wright, The Surgery, Sandgate Hill, Folkestone. *July 17th*, 1953.

* * * *

A PROTEST

Sir,—I feel bound to protest against the publication of the letter which appears on page 452 of the current issue of *The Veterinary Record*.

Blasphemy, even near-blasphemy, always gives grave offence to many. Apart altogether from this, educated Indian people are highly susceptible to, and are readily hurt by, ridicule of their compatriots, and this is particularly so at the present time. Further, the publication of such a thing in the journal of the British Veterinary Association is damaging to the dignity and prestige of our profession.—Yours faithfully, J. Russell Greig, Moredun Institute, Edinburgh, 9. *July 23rd*, 1953.

DISEASES OF ANIMALS ACT, 1950—GREAT BRITAIN

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period	Anthrax	Foot-and-mouth	Fowl Pest	Sheep Scab	Swine Fever
16th to 30th June, 1953	20	1	135	—	110
Corresponding period in—1952	12	43	7	—	27
1951	10	—	18	—	50
1950	12	—	6	—	14
1st January to 30th June, 1953 ...	434	26	508	—	1,733
Corresponding period in—1952	274	408	121	1	557
1951	260	18	494	4	478
1950	211	14	87	19	22

Tuberculosis (Attested Herds) Schemes

The number of Attested Herds, *i.e.*, herds officially certified as free from Tuberculosis as at June 30th, 1953, was as follows:—

England	Wales	Scotland	Total (Great Britain)
50,475	27,999	25,585	104,059

Advertiser's Announcement

Improved Braxy Vaccine

Burroughs Wellcome & Co. announce the introduction of a new, improved Braxy Vaccine developed as a result of research in The Wellcome Research Laboratories. It contains the products of lysed *Cl. septicum* and the specified toxoid, the latter precipitated with potash alum. Field trials involving over 8,000 sheep here demonstrated the high level of efficiency of this new vaccine at a dose rate of only 2 c.c. compared with 5 c.c. of the formalised whole culture vaccine which has been widely used during the past 20 years.

"Wellcome" Improved Braxy Vaccine is issued in containers of 50 c.c. (25 doses) and 100 c.c. (50 doses). Further information is obtainable on request to The Veterinary Sales Division, 183, Euston Road, London, N.W.1. (Telephone: EUSton 4477.)

B.V.A. ANNUAL CONGRESS IN ABERDEEN

SEPTEMBER 6th to 12th, 1953

Programme

N.B.—All meetings will take place in the Music Hall unless otherwise stated.

SUNDAY, SEPTEMBER 6th

8.00 p.m.
"At Home," given by the North of Scotland Division, B.V.A., at the Caledonian Hotel.

MONDAY, SEPTEMBER 7th

10.00 a.m.
Civic Welcome by the Hon. the Lord Provost of Aberdeen (Rev. Professor John M. Graham, M.A.), followed by Opening of Congress by the Lady Tweedsmuir, M.P.

10.30 a.m.
Opening of Exhibition of Surgical Instruments, Drugs, etc., by the President, B.V.A.

12 noon
Three short films on Small animal Surgery, by Dr. J. S. A. Spreull, M.R.C.V.S.

2.30 p.m.
Paper : "Recent Advances at Weybridge," by Dr. A. W. Stableforth, M.R.C.V.S., D.V.S.M., Weybridge.
Opener : Mr. D. L. Hughes, F.R.C.V.S., DIP. BACT.
Chairman : Professor A. Robertson, M.A., PH.D., B.SC., M.R.C.V.S., F.R.I.C., F.R.S.E.
Recording Secretary : Mr. L. G. Donald, B.SC., M.R.C.V.S.

8.00 p.m.
Civic Reception and Dance, given by the Lord Provost and Corporation of the City of Aberdeen in the Beach Ballroom.

TUESDAY, SEPTEMBER 8th

10.00 a.m.
Paper : "Pig Housing and its Relation to Health," by Mr. D. S. Soutar, A.R.I.B.A., A.A. DIP., A.R.I.A.S., North of Scotland College of Agriculture.
Openers : Mr. D. F. Oliver, B.SC., M.R.C.V.S., and Dr. D. Luke, B.SC., M.R.C.V.S.
Chairman : Mr. H. M. Wilson, M.R.C.V.S.
Recording Secretary : Mr. M. Maclellan, M.R.C.V.S.

10.15 a.m.
Ladies' Guild Annual General Meeting in the Lower Green Room.

12.15 p.m.
Films, shown by Mr. D. D. Ogilvie, B.SC., M.R.C.V.S.

2.30 p.m.
Demonstration (Methods of Pig Housing) at Craibstone Farm and elsewhere, arranged by Mr. D. S. Soutar, A.R.I.B.A., A.A.DIP., A.R.I.A.S. (For Members only.)

2,30 p.m.
Ladies' Excursion, to Paradise Woods and Alford.

8.30 p.m.
Ladies' Guild Dance at Northern Hotel.

WEDNESDAY, SEPTEMBER 9th

10.00 a.m.
Paper : "Veterinary Application of Antibiotics and other Modern Therapeutic Substances," by Dr. S. F. Scheidy, V.M.D., West Point, Pennsylvania, U.S.A.
Opener : Mr. D. D. Ogilvie, B.SC., M.R.C.V.S., Manchester.
Chairman : Dr. W. R. Wooldridge, M.SC., M.R.C.V.S.
Recording Secretary : Mr. G. A. M. Sharman, M.R.C.V.S.

12 noon
Meeting of 1952–53 Council, B.V.A.

1.00 p.m.
Glasgow Veterinary School Alumnus Association Annual General Meeting and Lunch, Caledonian Hotel.

2.30 p.m.
Congress photograph.

3.00
Annual General Meeting, B.V.A.
Ladies' Excursion to Grandholm Woollen Mills. (Limited to 40.)

7.00 for 7.30 p.m.
Annual Banquet at Northern Hotel.

THURSDAY, SEPTEMBER 10th

10.00 a.m.
Paper : "Some Aspects of Veterinary Dermatology," by Mr. S. Jennings, M.R.C.V.S., Glasgow.
Opener : Mr. E. F. Lewis, M.R.C.V.S.
Chairman : Mr. A. J. MacLennan, B.SC., M.R.C.V.S.
Recording Secretary : Mr. James A. Brown, M.R.C.V.S.

1.45 p.m.
Congress Excursion to Deeside.
Golf Competition, Bowling, etc.

6.30 for 7.00 p.m.
Royal Dick Alumnus Association Annual General Meeting and Dinner : Northern Hotel.

From 8.30 p.m.
Informal Social Evening, with some entertainment, at the Northern Hotel.

FRIDAY, SEPTEMBER 11th

10.00 a.m.
A Symposium of Short Papers :—
(*a*) Dr. J. G. Campbell, F.R.C.V.S. "Some Aspects of Research Work at the Poultry Research Centre, Edinburgh."
(*b*) Mr. J. A. Crichton, M.B.E., M.A., B.SC. "Experiments with Identical Twin Calves."
(*c*) Dr. K. L. Blaxter, B.SC., N.D.A. "Muscular Dystrophy."
(*d*) Dr. W. S. Gordon, C.B.E., M.R.C.V.S., F.R.S.E., and Mr. J. H. Taylor, M.R.C.V.S. "Antibiotics in Animal Feeding-stuffs."
Chairman : Mr. A. Thomson, M.R.C.V.S.
Recording Secretary : Mr. J. Suttie, M.R.C.V.S.

12.30 p.m.
Association of Veterinary Teachers and Research Workers Annual General Meeting in the Lower Green Room.

2.30 p.m.

Visit to Rowett Research Institute Laboratories by permission of Dr. D. P. Cuthbertson, F.R.S.E., and Dr. A. T. Phillipson, M.A., M.R.C.V.S.

Clinical Demonstration at V.I.O. Laboratory at North of Scotland College of Agriculture, arranged by Mr. P. L. Shanks, B.Sc., M.R.C.V.S. (Members only.)

2.30 p.m.

Ladies' Excursion to Crathes Castle.

8.30 p.m.

President's Reception and Dance at the Northern Hotel.

SATURDAY, SEPTEMBER 12th

10.00 a.m.

Closing Meeting of Congress, followed by First Meeting of 1953–54 Council.

B.V.A. 71st ANNUAL CONGRESS

Aberdeen, September 6th to 12th, 1953

LIST OF HOTELS

(The information given here has been extracted from the Aberdeen Corporation Publicity Department Register of Accommodation, 1953. A copy of this Register, giving fuller details of the accommodation, may be obtained free of charge on application to the Aberdeen Corporation Publicity Department, 24, Union Street, Aberdeen.)

Key to Facilities.—A, hot and cold running water in all bedrooms ; B, gas or electric fires in all bedrooms ; C, central heating D, ; children taken ; E, games room ; F, dogs taken ; G, garage facilities.

BLOCK-BOOKED ACCOMMODATION

Name and address	Whether licensed	Facilities (see above)	Terms	
			Bed and breakfast	Full board
Douglas Hotel, Market Street	Yes	ACD	22/6 + 10%	—
Gloucester Hotel, Union Street	Yes	ACD	22/6 + 10%	—
Imperial Hotel, Stirling Street	Yes	ADF (B some)	18/6 to 21/–	9 gns.
Marcliffe Hotel, Queen's Terrace	Yes	ABDEG	from 18/6	8 gns.
Station Hotel, Guild Street	Yes	A (some private bathrooms) CDG	from 22/6	from 37/6 per day

A number of bedrooms in the above hotels have been block-booked over the period of the Congress for the use of members of the B.V.A. and their families. Members should mention that they will be visiting Aberdeen in connection with the Congress.

No rooms within the block reservations remain available at the Caledonian and Northern Hotels, and no single rooms remain at the Gloucester Hotel.

OTHER RECOMMENDED HOTELS

Bon-Accord Hotel, Market Street	Yes	ABCDF	17/–	£8/15/–
George Hotel, Bon-Accord Terrace	Yes	ABG	from 17/6	9 gns.
Royal Hotel, Bath Street	Yes	ABCD (F, small dogs)	from 15/–	27/– to 28/6 per day
Waverley Hotel, Guild Street	Yes	ADFG	from 15/6	8 gns.
Cults Hotel, Cults	Yes	ABDF	from 14/6	7 gns.
Amatola Hotel, 488, Great Western Road	No	ABCDFG	12/6 and 15/6	7 gns.
Atholl Hotel, 54, King's Gate	No	ABCDFG	10/6 to 15/–	from 6 gns.
Badentoy Private Hotel, 3, Queen's Gate	No	ABCDFG	15/– to 17/6	6½ to 8 gns.
Belvidere Private Hotel, 59, Queen's Road ...	No	BD(A some)	from 15/6	6½ to7 gns.
Clifton Hotel, 11, Bon-Accord Square	No	ABDG	12/6	from 7 gns.
Colwyn Private Hotel, 73, Dee Street	No	ABD	613/6	5 gns.
Crescent Hotel, 16-17, Bon-Accord Crescent ...	No	BDG (A some)	12/ and 13/6	6 to 7 gns.
Earl's Court Hotel, 96, Queen's Road	No	ABDG	15/6 to 17/6	from 6 to 8 gns.
Ferryhill House Private Hotel, Bon-Accord Street	No	ABCG	15/–	—
Glenesk House Private Hotel, 64, Queen's Road ...	No	ABDF	12/6 to 15/6	6 to 7 gns.
Gordon House Hotel, Rubislaw Den North ...	No	CDFG (AB some)	17/6	7 and 8 gns.
Great Western Hotel, Great Western Road ...	No	ACDFG (B some)	17/6	8 gns.
Gushetneuk Private Hotel, 3, Belvidere Street ...	No	BD (A some)	15/6	6 gns.
Hastie's Hotel, Deemount Terrace	No	AG	15/–	from £6/15/–
Highland Hotel, 52-56, Dee Street	No	ABDFG	12/– and 14/–	6 gns.
King's Gate Private Hotel, 7, King's Gate ...	No	ABD	13/–	6 gns.
Mannofield Hotel, 447, Great Western Road ...	No	ABCG	12/6	6 gns.
Osborne Private Hotel, 7 and 8, Queen's Gardens	No	ABCD	from 14/6	£6/16/6
Queen's Hotel, 53, Queen's Road	No	ABG	15/–	7 gns.
Richmond Hotel, 2, Albyn Terrace	No	ABCDFG	16/6	7 gns.

COUNTRY HOTELS

Ardoe House Hotel, Banchory-Devenick, Kincardineshire (4 miles).
Banchory Lodge Hotel, Banchory, Kincardineshire (18 miles).
Bay Hotel, Stonehaven, Kincardineshire (15 miles).
Gordon Arms, Culter, Aberdeenshire (8 miles).
Marine Hotel, Muchalls, Kincardineshire (10 miles).
Raemoir Hotel, Banchory, Kincardineshire (18 miles).
Station Hotel, Kintore, Aberdeenshire (12 miles).
The Heugh Hotel, Stonehaven, Kincardineshire (15 miles).
Tor-na-Coille Hotel, Banchory, Kincardineshire (18 miles).
Woodside House Hotel, Bucksburn, Aberdeenshire (4 miles) (unlicensed).